

EXAM KEY

INFORMATICS PRACTICES (065)

Dr. SUNIL KUMAR VATS

CLASS
XII





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INFORMATICS PRACTICES (065)

For Class XII

As Per the Latest Prescribed Syllabus by CBSE

First Edition

Dr. Sunil Kumar Vats



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Dedicated to my grandparents
Late Sh. Radha Krishan & Smt. Bharpi Devi
An inspiring source of motivation for me...



DISCLAIMER

While every effort has been made to ensure that the book is free of error, it is inevitable that some errors still remain. Please report any errors, suggestions or questions to the authors at the following email address.

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Preface

This book is intended as a focus on “Exam Pattern” for class XII in the subject of Informatics Practices. It is written to cover the latest syllabus prescribed by the CBSE. However it is very useful for the learner of Computer Network, Free Open Source Software, and Programming in Java, HTML and MYSQL.

India is the first country in the world to introduce various language (C++, JAVA, HTML) at senior secondary level. It provide as opportunity for students to learn new software technology. I appreciate CBSE initiative for including the latest and most useful topics at Senior Secondary level.

Chapter 1 explain the theory and practical concept of Computer Network and Open Standard. Networking is one of the most significant steps in the electronic evolutions, since the invention of the PC. A computer network is a group of connected computers that allow the sharing of information and peripherals. The most basic network is made up of two computers connected by some kind of cable in order to exchange information more quickly and efficiently. A standalone computer is very useful to many businesses, but without a network, those businesses would have to spend twice the amount of money on computerization than they would have to by implementing a network. The chapter also include the concept of Free and Open source Software.

Chapter 2 and 3 introduce the student with the basic concept of Java in practically as well as theoretically. Through the chapter, Students are able to learn the programming concept of Java in a very easy way.

Chapter 4 introduce the concept of web development. In Modern era, Information Technology has become the vital concept of human life. Internet is the most common path to serve the information to the world. So, web development is the very interesting and common feature among student, which they want to learn.

Chapter 5 and 6 provide the opportunity to the students aware about the concept of MYSQL (Back-end) and its connectivity with JAVA (Front-end) and provide the basic concept to work with MYSQL in a very easy way.

Chapter 7 provide the concept of Information Technology’s Application. It provide the platform to the student to create interface with those application, which are in their daily use.

This book help the students to understand the concept of programming in java, HTML and MYSQL. Finally, you'll learn about the conventions used in this book for pointing out special helps like notes, tips, cautions, and references to the data files. Chapter 1-7 are focused strictly as per Class XII Syllabus prescribed by CBSE, Last Year Question Paper with solution and Glossary is included in the form of **Chapter 8**.

I would like to thank whole the staff of Jawahar Navodaya Vidyalaya, Mohindergarh for allowing me the chance to teach the classes in the subject of Computer Science and Informatics Practices and giving me the freedom I needed to develop such material. I would also like to acknowledge the influence of my colleagues. The most beautiful proofs and ideas grew out of material that I learned from them.

There are times in such projects when the clock beats you time and again and you run out of energy and you just want to finish it once and for ever. My parents made me endure such times with their unfailing humor and warm wishes with full of mental support and love. To my wife Smt. Savita Sharma, I owe more than what I can mention. Unintentional love & support of my brother, sister and my twin chaps Abhishek, Abhinav and all other kids of my family (Abhimanyu and Abhisar) who helped me profoundly in making this coding script even livelier.

This acknowledgement would not be completed without extending my thanks to my role model **Sh. Ramphal Sharma** and **Sh. Birbal Singh Dhania**, who helped me clear any doubts that arose during my writing. Any and all remaining errors or inconsistencies are mine. I will gladly take reader and user feedback to correct them, along with other suggestions to improve the text.

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Blue Print

INFORMATICS PRACTICES (065)

CLASS -XII

UNIT		SHORT ANSWER (1 MARK)	SHORT ANSWER (2 MARKS)	LONG ANSWER (6 MARKS)	TOTAL
NETWORKING AND OPEN STANDARDS		4(4)	3(6)	-	7(10)
GUI PROGRAMMING-I	JAVA	7(7)	6(12)	1(6)	14(25)
PROGRAMMING-II	WEB DEVELOPMENT				
DATABASE CONNECTIVITY	MYSQL				
RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)		4(4)	7(14)	2(12)	13(30)
IT APPLICATION		1(1)	2(4)	-	3(5)
TOTAL		16(16)	18(36)	3(18)	37(70)

Question Paper Design Class-XI (2017-18) and XII (2017-18)

S.No.	Typology of Questions	Very Short Answer (VSA) (1 mark)	Short Answer-I (SA-I) (2 marks)	Short Answer-II (SA-II) (4 marks)	Long Answer (L.A) (6 marks)	Total Marks	% Weightage
1	Knowledge Based	4	3	2	-	18	25.7
2	Conceptual Understanding	4	5	1	-	18	25.7
3	Reasoning Based	4	-	2	1	18	25.7
4	Skill based	-	1	2	1	16	22.9
	Total marks	12	9	7	2	70(30)	100

1. No chapter wise weightage. Care to be taken to cover all the chapters.
2. The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and topology of questions same.
3. Questions may be case based requiring problem solving skills.
4. LA Questions may be case-based requiring problem-finding and problem -solving skills.

Appendix 'A'

Swing Control, Method & Properties	
Class:	Jbutton
Swing Control:	JButton
Methods:	getText(), setText()
Properties:	Background, Enabled, Font, Foreground, Text, Label
Class:	Jlabel
Swing Control:	JLabel
Methods:	getText(), setText()
Properties:	Background, Enabled, Font, Foreground, Text
Class:	JtextField
Swing Control:	JTextField
Methods:	getText(), isEditable(), isEnabled(), setText()
Properties:	Background, Editable, Enabled, Font, Foreground, Text
Class:	JRadioButton
Swing Control:	JRadioButton
Methods:	getText(), setText(), isSelected(), setSelected()
Properties:	Background, Button Group, Enabled, Font, Foreground, Label, Selected, Text
Class:	JcheckBox
Swing Control:	JCheckBox
Methods:	getText(), setText(), isSelected(), setSelected()
Properties:	Button Group, Font, Foreground, Label, Selected, Text
Class:	ButtonGroup
Swing Control:	JButtonGroup
Methods:	
Properties:	Add
Class:	JcomboBox
Swing Control:	JComboBox
Methods:	getSelectedItem(), getSelectedIndex(), setModel()
Properties:	Background, ButtonGroup, Editable, Enabled, Font, Foreground, Model, SelectedIndex, SelectedItem, Text
Class:	Jlist
Swing Control:	JList
Methods:	getSelectedValue()
Properties:	Background, Enabled, Font, Foreground, Model, SelectedIndex, SelectedItem, SelectionMode, Text

Class:	Jtable
Swing Control:	JTable
Methods:	addRow(), getModel()
Properties:	Model
Class:	JOptionPane
Swing Control:	
Methods:	showMessageDialog()
Properties:	
Class:	DefaultTableModel
Swing Control:	
Methods:	getRowCount(), removeRow(), addRow()
Properties:	
Commonly used Methods	
Class	Methods
Integer	parseInt(), toDouble(), toString()
String	concat(), length(), substring(), toDouble(), toLowerCase(), toUpperCase(), trim()
Double	parseDouble(), toString(), toInt()
Math	pow(), round()
Database Connectivity Methods	
Class	Methods
Connection	createStatement(), close()
DriverManager	getConnection()
Statement	executeQuery()
ResultSet	next(), first(), last(), getString()
Exception	getMessage()
System	exit()

Note: The visual properties of any of the elements and Data connectivity methods (the properties/methods, which are not highlighted in the above tables) will not be tested in the Theory examination but may be used by the student in the Practical and Projects.

Sample Guidelines for GUI Programming

1. To display a message using Label, TextBox, MatDialog using simple GUI applications
2. To concatenate two text entries and display using simple GUI application
3. To perform a simple arithmetic operation (+, -, *, /) and display the result in MatDialog or TextBox using simple GUI application
4. To perform simple arithmetic operation (+, -, *, /) and display the result in TextBox using simple GUI application.
5. To make simple decision making (if statement) solution and display relevant message using GUI
6. application (Example - Problems related to Eligibility for a given value of Age, "Profit" or "Loss"
7. messages for given values of Cost Price and Sale Price, Grade Display for given values of Marks of students etc.)
8. To create a simple GUI application to perform both arithmetic and logical operation together (Example – Total, Average and Grade calculation for given marks, Salary Calculation on different criteria)
9. To create a simple GUI application to perform an operation based on the criteria input by the user in a CheckBox or a RadioButton.
10. (**Example 1:** Find the Discount of an item on the basis of Category of item [Electrical Appliance/Electronic Gadget/Stationary specified using a Radio button] and its Cost [Below 1000/Above 1000/Equal to 1000 specified using a Radio button]).
11. (**Example 2:** Calculate the incentive of a Sales Person on the basis of his Sales Amount, Customer
12. Feedback, Count of Customer specified using CheckBox)
13. To create a simple GUI application to change the property of a swing element based on the selection made by the user
14. (**Example 1:** To change the background or Foreground color of any of the Swing elements of the form based on the color selected from a list)
15. (**Example 2:** To change the foreground and background color of a label based on the values
16. input/stored in a combo box)

17. To create a simple GUI application for repeatedly doing a task based on the user input.
18. (Example: To display the multiplication table of a number input by the user)
19. To store the data (Admission No., Name, Date of Birth, Class and Section) of 10 students in a table [Table] and find total number of students in each class and section.

Sample Guidelines for Connectivity Problems

20. To create a simple GUI application that counts and displays the number of records present in a database table.
21. To create a simple GUI application that displays the records of a database table in a tabular format (using jTable) on the GUI form.
22. To create a simple GUI application that displays the records of a database table in a tabular format (using jTable) on the GUI form based on a criteria input by the user.
23. To create a simple GUI application to perform a calculation based on a value retrieved from database table and a value entered by the user in a GUI application.

Know More (beyond syllabus):

- ✓ Teachers may also motivate students to search for topics of emerging ICT technologies such as Web
- ✓ Services, Cloud Computing, SDK on Android etc. for group discussions and presentations.
- ✓ Students may be encouraged for collaborative programming and remote trouble shooting.

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NETWORKING AND OPEN STANDARDS

Networking and Open Standard

- ✓ Networking: a brief overview
- ✓ Communication Media: Wired Technologies – Co-Axial, Ethernet Cable, Optical Fiber;
- ✓ Wireless Technologies – Blue Tooth, Infrared, Microwave, Radio Link, Satellite Link;
- ✓ Network Devices: Modem, Hub, Switch, Repeater, Gateway – and their functions
- ✓ Types of network: LAN, MAN, WAN, PAN
- ✓ Network Topologies: Star, Bus, Tree
- ✓ Network Protocols: HTTP, TCP/IP, PPP, Remote access software such as Team Viewer
- ✓ Identifying computers and users over a network: Basic concept of domain name, MAC (Media Access Control), and IP Address, domain name resolution
- ✓ Network Security Concepts: Cyber Law, Firewall, Cookies, Hackers and Crackers
- ✓ Network security threats: Denial of service, Intrusion problems, Snooping, Eavesdropping
- ✓ Internet Applications: SMS, Voice Mail, Electronic Mail, Chat, Video Conferencing
- ✓ Wireless/Mobile Communication: GSM, CDMA, WLL, 3G, 4G

Open Source Concepts

- ✓ Open Source Software (OSS), common FOSS/FLOSS examples (GNU/Linux, Firefox, OpenOffice, Java, Netbeans, MySQL). Common open standards (HTML, XML, ODF, TCP/IP, CSS)
- ✓ Indian Language Computing: Character encoding, UNICODE, different types of fonts (open type vs true type, static vs dynamic), Entering Indian Language Text – phonetic and key map based, Inscript.

POINTS TO REMEMBER

1. A Collection of interrelated computer is known as Network.
 2. Computer in the Network is known as Node.
 3. In a network one or more system can be act as server.
 4. A network in to a building is known as LAN.
 5. LAN has its own local domain and control.
-

6. LAN uses Ethernet or Token- Ring Technology.
7. Most of the LAN used Ethernet Technology, Token Ring is rarely seen.
8. Ethernet was invented in 1970 and Giga Ethernet in 1995.
9. A network of network is known as Internet.
10. Internet uses TCP/IP (Transmission Control Protocol/Internet Protocol) protocol.
11. Internet is widely implemented using IPv4 (Internet Protocol Version 4) due to shortage of space.
12. Network topology is an arrangement of nodes in the network.
13. Node in mesh topology works as relay for other node.
14. A media, used to transfer or receive data is called Transmission Media.
15. Guided and Unguided media is the two type of Transmission Media used in Networking.
16. A Kind of connection, which can be made through physical connection is called Guided Media.
17. Twisted Pair Cable, Coaxial Cable and Cable are the three type of guided media.
18. A Kind of media, where transmission can be made through air or wireless is known as unguided media.
19. Radio Transmission is a kind of unguided media, which have the penetration through walls.
20. Microwave transmission doesn't have the penetration through solid object.
21. Infrared travel in straight line due to its directional nature and have the lack of penetration.
22. Firewall is a technique used to secure system from unauthorized access.
23. Digital Certificate is an electronic document used for a secure document.
24. Cookies is a small piece of data sent from a website and stored on the user computer by the user's web browser.
25. Cyber Crime refer to any crime wherein the computer is used as the tool for the crime.
26. The police have the right to detect the cyber-crime under TITA (The Information Technology Act 2000).
27. Cyber law are contained in IT Act, 2000 which was passed by the Indian Parliament in May, 2000.
28. The Act was amended in 2008 and is effected from October 27, 2009.

Computer Network:

A System of interconnected computers (Node) and other expensive devices which are able to communicate with each other and share hardware and software resources. The Interconnection among Node facilitates information sharing among them. Node may connect through physical media or through air.



Need of Networking:

- a) Resource Sharing
- b) File and data sharing.
- c) Data security and centralized security
- d) High Reliability
- e) Communication Media
- f) High Speed
- g) Flexible working environment
- h) Cost factor

Application of Networks

1. Sharing of data, services and resources as Printer and other Storage Devices.
2. Access to remote database.
3. Exchange of Information by means of e-mail and FTP.
4. Interaction with other users using dynamic web pages.
5. Communication facilities.

Classification of Computer Networks

Computer Networks can be classified on their geographical area, connectivity and architecture. Generally a Network is classified on their geographical length. It may be so small as your Cell Phone and its Bluetooth headphone and so large as Internet. It may be classified as:

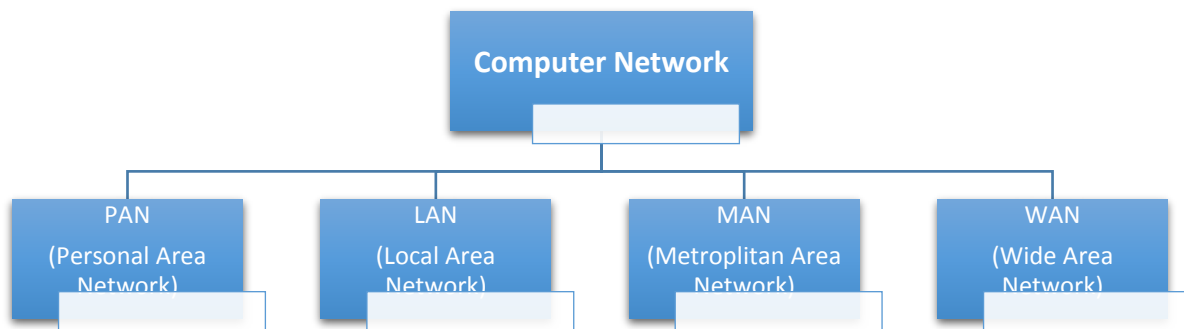
Personal Area Network

A Personal Area Network is a personal area network, which include Bluetooth enabled devices or infra-enabled device.

Local Area Network

Local Area Network is a kind of network which is situated in to a single building or closely situated building. Number of system connected in LAN may vary from two to 16

million. It mostly operate on private IP and doesn't have heavy routing. It include its own local domain and used Ethernet or Token Ring Technology.



Metropolitan Area Network

Metropolitan Area Network generally expands throughout a city such as cable TV Network. It may be in the form of Ethernet, Token Ring, ATM or Fiber Distributed Data Interface. Metro Ethernet service is provided by ISP (Internet Service Provider). It may provide uplink for LAN to WAN.

Wide Area Network

Wide Area Network include a wide area which may include sub-continent or a whole country. These Network provide connectivity to MANs and LANs at very high speed. But the hardware used by this network is very expensive.

Ethernet

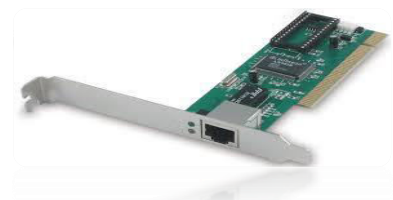
Ethernet is a widely deployed technology invented in 1970 with IEEE (Institute of Electrical and Electronics Engineers) 802.3 in 1980. Traditional Ethernet uses 10BASE0-T specification. The number 10 depicts speed in MBPS and T stands for Thick Ethernet. It uses Coaxial cable or Cat-5.

Terminology of Networks:

Nodes (Workstations):- The term nodes refer to the computers that are attached to a network and are seeking to share the resources.

Server:- A computer that facilitates the sharing of data, software and hardware resources on the network

Network Interface Unit/Card: A network interface unit is interpreter that helps in establishing the communication between the server and the client.



Media Access Control: The hardware Address of the Network interface Card is called Media Access Control. This is the unique hardware number on Network.

TCP/IP Address: Transmission Control Protocol/Internet Protocol is the most commonly used protocol on Internet that ensure end to end communication on Internet.

SMTP stand for Simple Mail Transfer Protocol is a protocol that controls the transfer of email message on internet.

FTP stand for File Transfer Protocol used for transferring files to and from remote host.

Domain Name Service (DNS) is a network service to translate Domain Name to its corresponding IP Address. It is a way to identify and locate the computers connected to the internet. It must be unique.

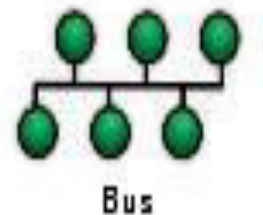


Network Topologies:

The term Network Topologies refer to the way in which the nodes of a network are physically connected together. The important network topologies are

Bus Topology or Linear Topology

In this topology a single length of the transmission medium is used onto which the various nodes are attached. The transmission from any station travels the length of the bus, in both directions and can be received by all other stations. The bus has a terminator at either end which absorbs the signal, removing it from the bus.



Characteristics:

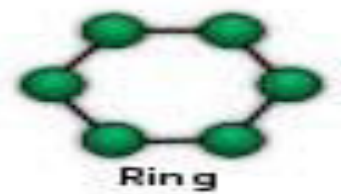
- Short cable length and Simple wiring layout
 - A single cable called trunk is used through which all data propagates and to which all nodes are connected
- Easy to extend
- There is no central point of failure on a bus because there is no hub.
- Entire network shuts down if there is break in the main cable.
- Terminators are required at both ends of the backbone cable.
- Difficult to identify the problem if the entire network shut down.
- Addition of nodes negatively affects the performance of the whole network.
- Only one computer can send messages at a time

Ring Topology

In a ring topology each node is connected to two and only two neighboring nodes. Data is accepted from one of the neighboring nodes and is transmitted onwards to another.

Thus data travels only one direction.

- Every computer serves as a repeater to boost signals
- Short cable length.
- Suitable for optical fiber
- Difficult to add computers
- More expensive
- If one computer fails, whole network fails
- Data clashes can also occur if two machines send messages at the same time.



Star Topology

A star topology is designed with each node connected directly to the server via hub or switch. This topology is used in most existing information network. Data on a star network passes through the hub or concentrator before continuing to its destination.



- Easy to install and wire
- No disruptions to the network when connecting or removing devices.
- Easy to add new station as each station has direct cable connection to hub or switch.
- Depending on the intelligence of hub, two or more computers may send message at the same time
- One malfunctioning node does not affect the rest of the network.
- Required more cable length than a linear topology.
- All signals transmission through the hub; if down, entire network down

Hardware Required for Networking

MoDem

Modem acronym for Modulation and Demodulation, is a device that converts digital data originating from a terminal or computer to analog signals used by voice communication network such as the telephone system. At one end, modems convert the digital pulse to audible tones and convert audio tones back to digital pulses at the other



RJ-45 Connector: The RJ-45 is a single line jack for digital transmission over ordinary phone wire. It is a 8 wire connector which is commonly used to connect computers on the LAN



(especially Ethernets). RJ – short for Registered Jack – 45

Ethernet Card or NIC or NIU: A NIC (Network Interface card) is a computer circuit board or card that is installed in computer so that it can connected to network. It is suitable for coaxial or twisted pair cables.

Hub: Hub is a device used to connect several computers together. It is a multi-port card. Hubs forward any data packets including e-mail, word processing documents or print request – they receive over one port from one workstation to all of their remaining ports. Hub can be Active or Passive. Active HUB are used to extend the length of the Network. Passive HUB allow the signal to pass from one computer to another without any change.

Switches: Switches are smart hubs that send data directly to the destination rather than everywhere within network. When the switch receive a packet, the switch examines the destination and source hardware address and compare them to a table of a network segments and addresses. If the segments are the same the packet is dropped and if the different then the packet is forwarded to the proper segments.

Repeaters: A repeater is a device that amplifies a signal being transmitted on the network. Since a signal loses strength as it passes along a cable, it is often necessary to boost the signal with this device. The repeater electrically amplifies the signal it receives and rebroadcasts it.



Router:

A device that works like a bridge but can handle different protocols, is known as router. It is used to separate different segments in a network to improve performance and reliability.

Bridge

A Bridge is a kind of device, used to connect similar type of network. Bridge is so smart to know which computers are on which side of the bridge and it only allow those message that need to get other side of the network.

Solved Questions:

Q 1. What is MAC Address?

Ans In computer networking, a **Media Access Control address** (MAC) is a unique identifier assigned to most network adapters or network interface cards (NICs) by the manufacturer for identification, and used in the Media Access Control protocol sub-layer.

Q 2. Write two advantages of networks.

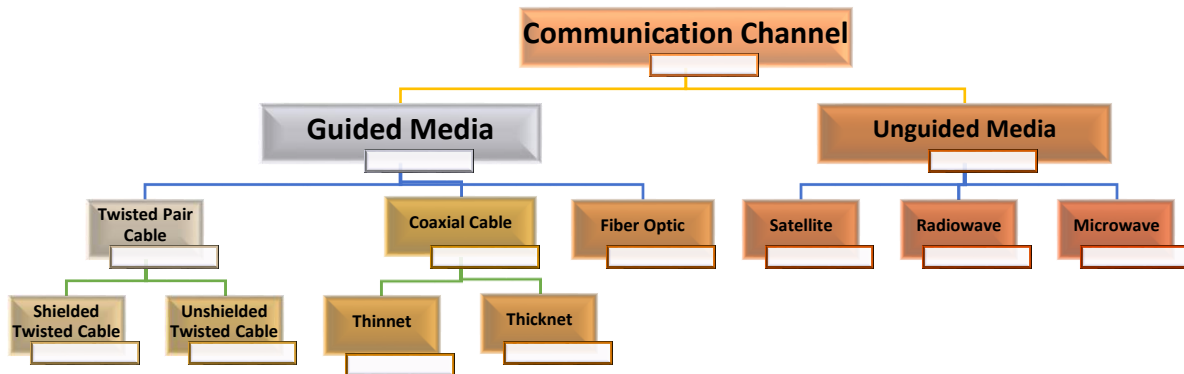
- Ans**
- i) Data or information can be shared among the users.
 - ii) Fast communication can be achieved.

Q 3. Write two disadvantages of networks.

Ans Disadvantages of networks:

- i. Sophisticated Hardware and software technology is required.
- ii. Expensive to install network.

Q 4. What is communication channel? Name the basic types of communication channels available.



Ans Communication channels are the medium to transfer data from source to destination through physical medium or through air. Communication Channel are divided in to two parts.

Q 5. Define a network.

Ans A computer network is a system in which computers are connected to share information and resources.

Q 6. What is IP address?

Ans A unique number consisting of 4 parts separated by dots, e.g. 165.113.245.2. Every machine that is on the Internet has a unique IP number - if a machine does not have an IP number, it is not really on the Internet. Every segment have the maximum value 255.

Q 7. What is domain name? How is it alternatively known?

Ans The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general. E.g.: cbse.nic.in.

Q 8. What are the various types of networks?

Ans Network can be classified on the basis of their size, complexity and geographical spread. On the basis of geographical spread it can be classified as Local Area Network, Metropolitan Area Network and Wide Area Network.

Q 9. What is the difference between MAN and WAN?

Ans A **metropolitan area network (MAN)** is a large computer network that usually spans a city or a large campus.

WAN is a network that covers an area larger than a single building or campus such as across the cities or countries.

Q 10. What is meant by Topology? Name some popular topologies.

Ans Network topology is defined as the interconnection of the various elements (links, nodes, etc.) of a computer network. In computer networking, topology refers to the layout of connected devices.

- Bus topology
- Star topology
- Ring topology
- Tree topology
- Mesh topology

Q 11. What are the similarities and differences between bus and tree topologies?

Ans In bus topology each machine is connected to a single cable. Each computer or server is connected to the single bus cable through some kind of connector. Tree topology is a network with the shape of an inverted tree in which a single link between two nodes.

Q 12. What are the limitations of star topology?

Ans i) Central node dependency: In this topology central node is a controller of the network. If the central node fails, the entire network will be failed.
ii) Difficult to expand: The addition of a new node to a network involves a connection all the way to the central node.

Q.13 What is Network Security?

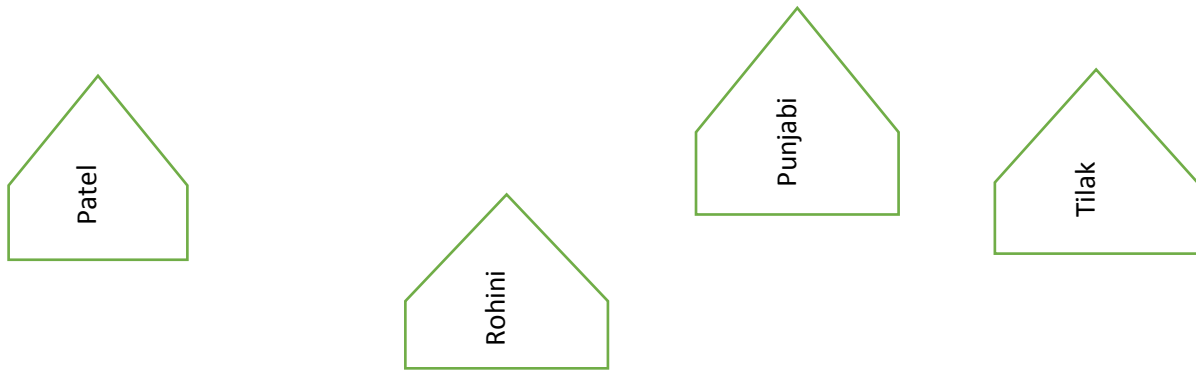
Ans Network security means to make effort to make sure only legal or authorized user and program gain access to network. Biometric System, Authorization, Authentication and Firewall is kind of term, which are used for Network Security.

Points to be Remember:

1. Hub should be preferred over repeater, if more than two computers are to be connected.
2. Bridge are preferred over hub, if we don't want to broadcast data frames.
3. Switch can replace multiple Bridges and offers dedicated bandwidth to each Local Area Network segment.

Long Answer Question

Q.1 Vats Industries has set up its new center at Banerjee Nagar, New Delhi for its office and web based activities. The company compound has 5 buildings as shown as in the diagram below.



Center to Center distance between various buildings is as:

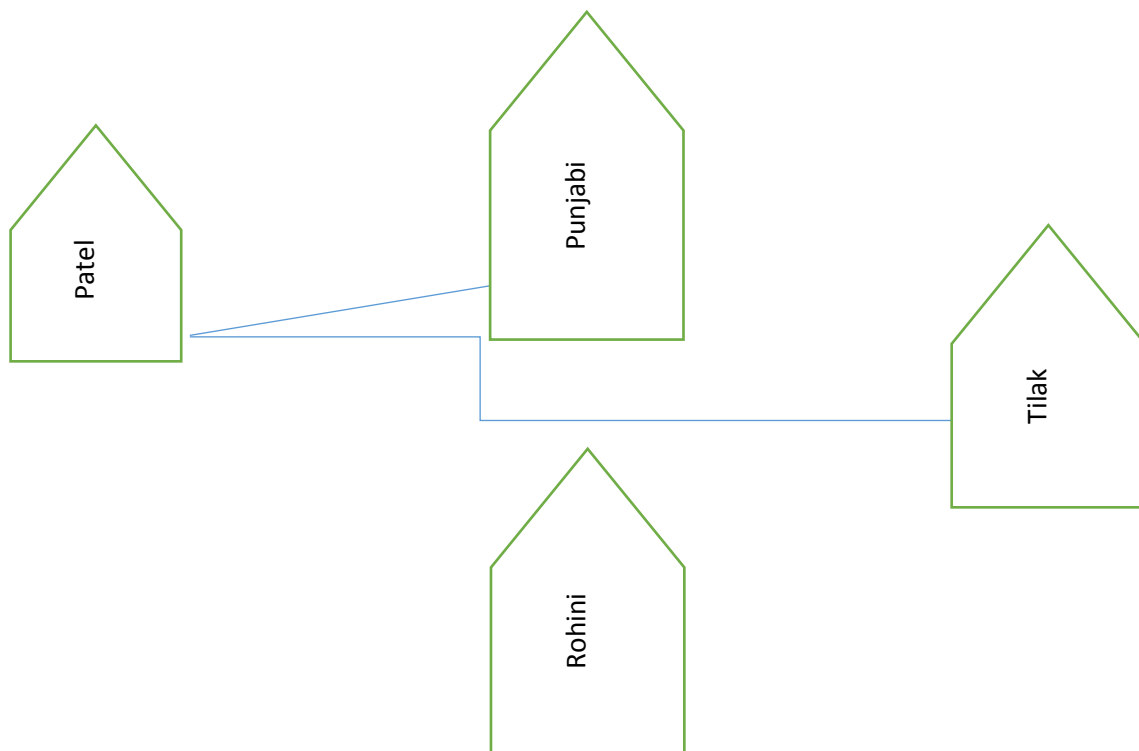
Rohini to Patel	60 M
Patel to Punjabi	75 M
Punjabi to Tilak	25 M
Tilak to Rohini	170 M
Rohini to Punjabir	125 M
Patel to Tilak	100 M

Number of Computers in each of the Buildings is follow:

Rohini	50
Patel	150
Punjabi	15
Tilak	25

1. Suggest a Cable layout of connections between the buildings.
2. Suggest the most suitable place for the server with reason.
3. Suggest the placement of **i. Internet Connecting Device/Modem ii. Switch.**
4. The organization is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN,MAN or WAN will be formed.

Ans. 1. Layout



2. Most Suitable Place for Server is “Patel” due to high number of Node.
3. i. Patel ii. Switch should be used in all building to interconnect the node.
4. MAN, because MAN is the kind of network, which is used to connect in the same city.

FREE AND OPEN SOURCE SOFTWARE

Free Software: It means software is freely accessible, free to use, changed, improved, copied, and distributed without any payments.

Four kinds of freedom:

- Freedom to run the program for any purpose
- Freedom to redistribute copies.
- Freedom to study how the program works
- Freedom to improve the program and release your improvements to the public



Open Source Software: The categories of software /

programs, which also provide the source code to the user, so that a user can make it customize. Licenses do not impose many conditions. Such type of software has the permission to redistribute or customize.

Features:

1. Freedom to run and use the software
2. Modify the program
3. Redistribute copies of either original or modified program (without paying royalties to previous developers).

It can be freely used for modifications, but it does not have to be free of charge. Its source code is available.

Criteria for the distribution of open source software

1. Free distribution
2. Source code
3. Derived works
4. Integrity of the Author's Source code
5. No discrimination against fields of endeavor.
6. Distribution of License
7. License must not be specific to a product
8. License must not restrict other software.

FOSS (free and open software) Free software- no payments Open source software- for technical progress

OSS and FLOSS

(Open source modified and redistributed software) free of cost or with nominal charge.

FLOSS- (free libre and open source software)

FSF (free software foundation)

- Founded by Richard Stallman in 1985 to support GNU project.
- Non-profit organization created for the purpose of supporting free software movement

GNU (free and open source)

- Objective: To create a system compatible to UNIX but not identical with it.
- Now it offers a wide range of software, including applications apart from operating system.

Proprietary software (neither open nor freely available)

- Definition- Its use is regulated and further distribution and modification is either forbidden or requires special permission by the supplier
- Source code is not available.

Freeware

- Free of cost
- Copying and further distribution but not modification.
- Source code is not available Example Internet Explorer

Shareware

- Right to redistribute copies
- After a certain period of time license fee should be paid.
- Source code is not available.
- Modifications are not possible.
- Objective- to increase user's will to pay for the software. Limits functionality after a trial period of 1-3 months.

Important Software's LINUX

- Linux: - free and open source software.
- It can be downloaded from www.linux.org
- Linux is a part of popular web server program LAMP (Linux, apache, MySQL, PHP).

Mozilla

- Freeware
- No source code available
- Free Internet Software

It can be downloaded from www.mozilla.org

Apache Server

- The most common web server (or HTTP server) software on the Internet.
- Apache is designed as a set of modules, enabling administrators to choose which features

they wish to use and making it easy to add features to meet specific needs including handling protocols other than the web-standard HTTP.

- Apache HTTP server is an open source web server.
- It is component of LAMP.

Denial-of-services attacks:

DOS are those attacks that prevent the legal users of System from accessing or using the resources, information or capabilities of the system. It may be of following types:

- **Denial of Access to Information:** Such attacks cause deletion or changing of important information to non-readable format.
- **Denial of Access to Applications:** Such attacks make the applications unusable or unavailable for legal user of the system.
- **Denial of Access to Communications:** Such attacks includes cutting of communication wire, jamming radio communications, flooding a system with junk mail.

Threats to network security: It may be of following types:

- **Snooping:** It refers to unauthorized access to someone else's data, email or computer activity.
- **Eavesdropping:** It refers to unauthorized listening / intercepting someone else's private communication / data/ information.

Standards:

Standards refers to an established set of rules or requirements which are approved by recognized body or widely used across various software platforms. For ex.: PDF (Portable documents format) is a technical standard widely used by the industry.

They are of two types: Proprietary Standards and Open Standards.

Proprietary standards are those for which users have to buy license to use them. For e.g. MS Office format .doc, .ppt, .xls etc

Open Standards are internationally accepted technical standards that guarantee that data can be exchanged across platforms and for any applications. Open is feely open to all.

Advantages of Open Standards:

- Making the data accessible to all.
- It ensures data is application and platform independence.
- Diversity and Interoperability in the Industry i.e. it enables business and people to go for any technology of their choice as per their needs and budget.

E.g.: ASCII Characters, HTML file, Joint Photographic Expert Group, Portable Network Graphic etc.

Ogg Vorbis:

- It is a new audio compression which is open format developed by Xiph.org. It is roughly comparable to mp3, mpeg-4 formats and is completely free, open and unpatented. Hence it imposes no restrictions on its usage, types of usage, distributions, redistribution etc.

Indian Language Computing:

- Indian Language computing refers to ability to interact in diverse Indian language on electronic system.

How to represent character in Memory?

- ASCII: American Standard Code for Information Interchange is widely used alphanumeric code in most microcomputers and minicomputers and in many mainframes. It is 7 bit code hence it can represent standard $2^7 = 128$ characters.

ISCII:

- Indian Standard Code for Information Interchange (ISCII) is an eight bit code capable of coding 256 characters. It retains all ASCII characters and also offers coding for Indian Scripts.

Transliteration:

- When we type Indian Language words phonetically in English script and tool will automatically convert them into corresponding language words called as transliteration.

UNICODE:

Unicode provides a unique number for every character, no matter what the platforms, no matter what the program, no matter what the language. Unicode can represent 94140 characters. Unicode standard has incorporated Indian Scripts under the group named Asian scripts. Indian scripts included as Devnagari, Bengali, Gurmukhi, Gujarati, Oriya, Tamil, Telugu, kannada, and Malayalam.

Fonts: Font refers to a set of displayable text characters called glyphs, having specific style and size. There are two categories of font: **True Type Font** and **Open Type Font**.

True Type Font: It is developed by Apple and licensed to Microsoft. It is 8 bit font which is compatible with Microsoft Windows and MAC OS.

Open Type Font: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Indian Language Text Entry:

Many Tools / software have been developed to facilitate the typing of Indian Language text. There are two type of text entries:

Phonetic Text Entry: Words typed as per their pronunciation in English script and later on converted to Corresponding (Hindi/Gujarati) language work is known as phonetic text entry.

Key map based text entry: When you type text from a keyboard having key mapping of Indian language characters, is known as key map based text entry., is known as key map based text entry.

Q 1. What is OSS?

Ans Open Source Software is a software available with source code and free to change/edit /redistribute and imposed no further restrictions on product or its usage.

Q 2. Expand the terms: OSI, FLOSS, FSF, GNU, W3C, and PHP.

Ans OSI: Open source Initiative

FLOSS:Free Libre and Open Source Software.

FSF:Free software Foundation created for the purpose of supporting free Movement.

GNU :GNU's Not Unix Project established with an objective to create a system Compatible to UNIX but not identical with it.

W3C: World Wide WEB consortium is responsible for producing the software standards for World Wide Web.

PHP: Hypertext Pre-processor is a widely used open source programming language primarily for server side applications and developing dynamic web content.

Q 3. What is free software?

Ans Free Software means the software is freely accessible and can be freely used, changed, improved, copies and distributed to others.

Q 4. Define freeware and shareware.

Ans The freeware is the software available free of cost and allows copying and further distribution but does not allows modification as its source code is not available.

Shareware is as software which is available for redistribution for stipulated time but after some time some license fee is required to be paid.

Q 5. What is openoffice.org?

Ans It is Office an application suite which is free software and directly competes with Microsoft Office. It is compatible with MS Operating System, UNIX, MAC OS.

Q 6. What is font? What is OTF?

Ans A font is a set of displayable or printable text characters having specific style and size.

Open Type Font: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Q 7. What are different font categories?

Ans There are two categories of font: True Type Font and Open Type Font.

True Type Font: It is developed by Apple and licensed to Microsoft. It is 8 bit font which is compatible with Microsoft Windows and MAC OS.

Open Type Font: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Q 8. Define ODF.

Ans ODF is an Open Document file Format used for exchanging office documents such as memos, reports, spreadsheets, database, charts and presentations. Open document is open, XML based file format used for exchanging office documents such as memos, reports, spreadsheets, database, charts and presentations.

Q 9. What is key map based text entry?

Ans When you type text from a keyboard having key mapping of Indian Languages characters is known as key map based text entry.

Q 10. What is Unicode?

Ans Unicode provides a unique number for every character, no matter what the platforms, no matter what the program, no matter what the language. Unicode can represent 94140 characters.

Q 11. What is ISCII?

Ans Indian Standard Code for Information Interchange (ISCII) is a coding scheme for representing various writing systems of India. It encodes the main Indic scripts and a Roman transliteration. When we type Indian Language words phonetically in English script and tool will automatically convert them into corresponding language words called as transliteration.

Q 12. What is Indian Script key map known as?

Ans Key map based text entry: When you type text from a keyboard having key mapping of Indian language characters.

Unsolved Questions:

1. What are the goals of network?
2. Write the applications of network?
3. What do you understand by domain name resolution?
4. What are communication channels? Discuss various channels available for networks?
5. Advantages and disadvantages of the followings :
 - i. Optic fiber
 - ii. Coaxial cables
 - iii. Twisted pair cables

- iv. Radio waves
- v. Microwaves
- vi. Satellite
- 6. Discuss and compare various types of networks?
- 7. Explain mostly used topologies.
- 8. What are hubs? What are its types?
- 9. What is the role of a switch in a network?
- 10. Discuss repeater.
- 11. What are common threats to network security?
- 13. What are denial of services attacks?
- 14. How can you prevent/ counter threats of network security?
- 15. When do you think, ring topology becomes the best choice for a network?
- 16. Write the two advantages and two disadvantages of star topology in network.
- 17. Write the disadvantages if twisted pair cables.
- 18. Define Hub.
- 19. Define switch.

Free and Open Standard

- 1. What is open source software?
- 2. Compare Free software and open source software.
- 3. Compare OSS and floss.
- 4. Compare Proprietary software and free software.
- 5. Compare Free ware and shareware.
- 6. Compare Freeware and free software
- 7. Write Short notes on GNU.
- 8. Write short notes on LINUX.
- 9. Write Short notes on MOZILLA.
- 10. Write short notes on APACHE.
- 11. Write short notes on POSTGRE SQL.
- 12. Write short notes on PHP.
- 13. Write short notes on Open Office.
- 14. What are technological standard and its various categories?
- 15. Mention some advantages of open standards.
- 16. What is the significance of Unicode in terms of Indian Language Computing?
- 17. How phonetic text entry is different from key map based text entry?

18. What is Ogg Vorbis? Why?
19. How to represent character in Memory?
20. What is font and its types?

GUI PROGRAMMING-I (JAVA)

Getting started with Programming using IDE

- ✚ Introduction, Rapid Application Development using IDE such as Netbeans.
- ✚ Familiarization of IDE using basic Interface components- (*As per appendix A*)
- ✚ Developing General Application (*As per the guidelines at appendix B*)

Programming Fundamentals

- ✚ Data Types: Concept of data types; Built-in data types - byte, short, int, long, float, double, char, string, boolean
- ✚ Variables: Need to use variable, declaring variables, variable naming convention, assigning value to variables.
- ✚ Integer object method: parseInt
- ✚ Double object method: parseDouble, parseFloat

Control Structures

- ✚ Decision Structure – if, if-else, switch.
- ✚ Looping Structure- while, do - while, for.

Programming Guidelines:

- ✚ General Concepts
- ✚ Modular approach;
- ✚ Stylistic Guidelines
- ✚ Clarity and simplicity of expressions and names.
- ✚ Comments, Indentation.
- ✚ Running and debugging programs, Syntax Errors, Run-Time Errors, and Logical Errors.
- ✚ Problem Solving Methodology:
- ✚ Understanding of the problem, Identifying minimum number of inputs required for output, breaking down problem into simple logical steps.
- ✚ Basic concept of Class, Object, Inheritance and Polymorphism
- ✚ Commonly used libraries:
- ✚ String class and methods: toString(), concat(), length(), toLowerCase(), toUpperCase(), trim(), substring()
- ✚ Math class methods: pow(), round()

POINTS TO BE REMEMBER

1. Java is a programming language of Third Generation followed by 1st Generation (Machine Language) 2nd Generation (Assembly Language).
2. Java provide two (Primitive and Reference) type of data type.
3. Java Supports eight type of primitive data type.
4. Java support five tokens (Identifiers, Keyword, Literals, Punctuators, operator)
5. Java Netbean is a free, open source software supported by Sun Java.
6. The occurrence of an activity is known as Event.
7. Properties are the attribute of graphical control.
8. Explicit type of conversion is performed by the programmer.
9. Implicit type of conversion is performed by the system itself.
10. Java provide two type (if, switch) of control statement.
11. The loop is also known as iteration statement.
12. Java provide three type of loop (for, while, do-while).
13. A frame is a top level window, where component can be placed by the user.
14. Button are action component.
15. Label is an un-editable control.
16. All components are the part of API (Application Programming Interface) Class
17. Radio Button provide two or more choice to its user by using buttongroup.
18. getPassword() method is used to obtain password from a password field,.
19. List and Combo Box are two common list type control.
20. A list allow three type of selection mode (Single, Single Interval and Multiple Interval).
21. Combo Box can be editable or non-editable.
22. Java Support three jump (return, break and continue) statement.
23. A block is a group of null or more than one statement enclosed in to braces.
24. Process of converting one type of data into other type of data is known as conversion.
25. A method/ function is a sequence of statement, used to perform a specific task.
26. Void method doesn't return any value.
27. All other method are used to return the value of its specific type.

Text Interaction:

- **getText() Method :** String name = nameTF.getText();
- **setText() method:** Stores or changes text in text based controls e.g. rankTF.setText("1");
- **Parse() Methods:** Used to convert a string value into numeric value.
- **JOptionPane.showMessageDialog ():** Displays a Message Box.

System.out.print (): It prints the desired output on output window.

System.out.println():It prints the desired output on output window and also changes the line.

Variable Scope: Program region within which a variable is accessible. It is accessible within the set of braces it is declared in.

```
if (..)
{
int x = 5;
....
}

System.out.println("The result is :"+ x); //error
```

Constant: Named memory locations whose value can't be changed in the program. It makes program easy to read, check & modify. e.g. `final int rateofinterest = 10;`

IDE- Integrated development Environment:

A programming environment, where all the tools required for programming are available under one roof is called IDE.

RAD- Rapid Application Development:

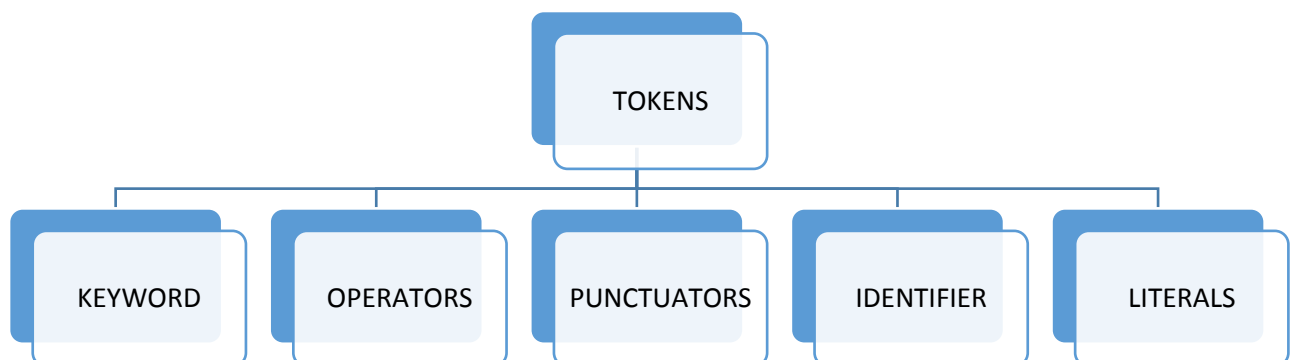
Rapid Application Development is a method of developing software/program with readymade tool. It help the user to create Graphical Interface with swing.

Container

As its name suggest, Container are such type of control, which contain the feature of other control inside. `JLabel`, `JFrame`, `JPanel` are the example of Container.

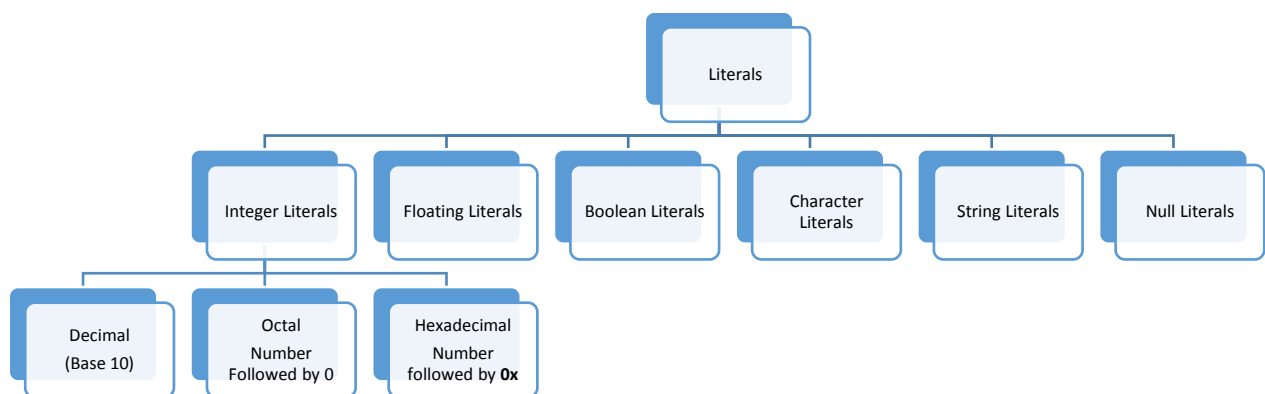
Token:

- The smallest individual unit in a program is known as Token. Java has the following types of tokens: *keyword*, *Identifier*, *literal*, *punctuators* and *operators*.



Keywords: Keywords are words that have a specific predefined meaning in Java. They cannot be used as variable names. They are also known as reserve words. Ex. For, int, double, void, private, public, while etc.

Literals: Literals have fixed values and declared during design time. They are also known as Constants. Various types of literals available in Java are :

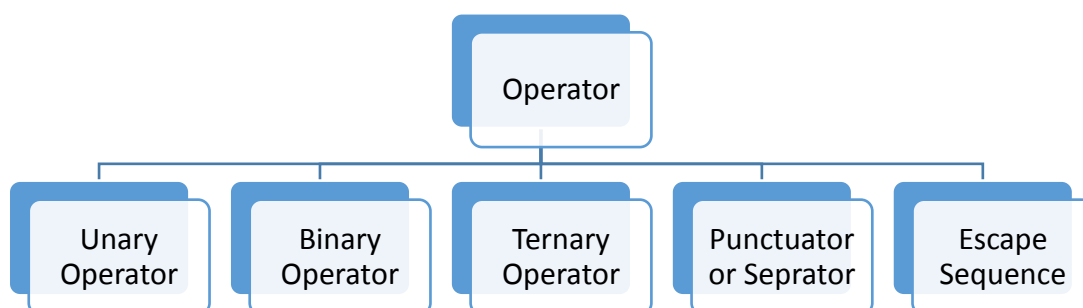


Identifiers: Identifiers are building block, used for the general terminology for various names given to the program segments. For example variable name, class name, function name. There are four rules to create Identifiers:

- i) It is a combination of alphabets, numbers, underscore and dollar sign
- ii) First character must be alphabet or underscore or dollar sign
- iii) Blank space are not allowed.
- iv) Reserve words cannot be used as variable name.
- v) Identifiers cannot begin with digit.

Operators:

Operators are symbols or group of symbols, which represent a operation in java. Operators in java can be classified as:



Unary operator- operators that require only one operand like ++, -- etc;

Binary operator – operator that require two operands like +, -, *, >, <, == etc.;

Ternary operator – which require three operands like?:

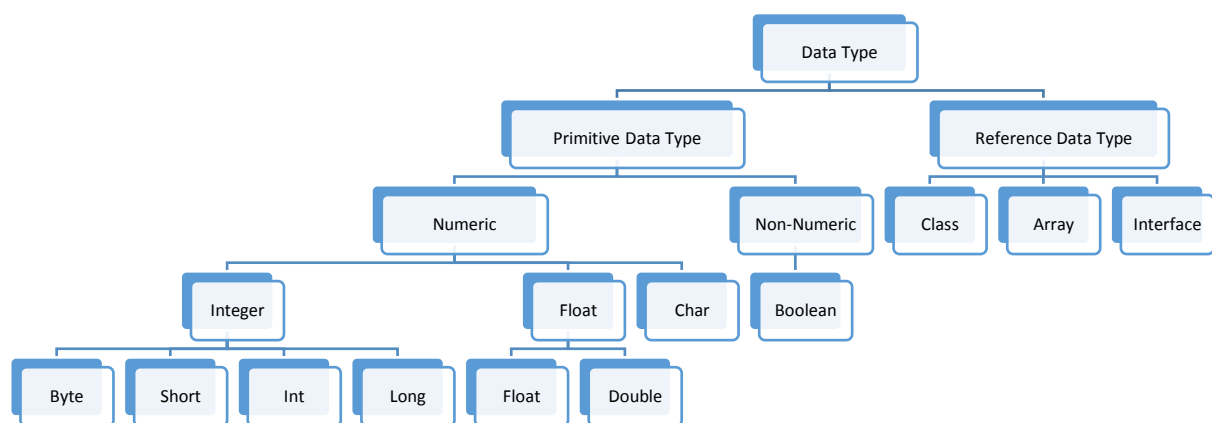
Other Operator - Arithmetic operator, Relational operator and Logical operator.

Punctuator or Separator: There are nine separator in Java: (){} [] . ; ,

Escape Sequence: When a back slash is encountered in a string of characters, the next character is combined with the backslash to form an escape sequence. Escape sequences are normally used to control printed or displayed output. For example, \a, \b, \n, \t, etc.

Primitive Data Types:

The Primitive Data Type also known as fundamental data type, which is used during the declaration of the variable in the language. The data type tells about the property of the variable, that which type of value must be hold by the variable. A primitive type is predefined by the language and is named by a reserved keyword. The primitive are divided in two primary category. Numeric and Non-Numeric by the Java programming language are:



Byte: The byte data type is an 8-bit signed two's complement integer. It has a minimum value of -128 and a maximum value of 127 (inclusive). It acquire 1 Byte of Space.

Short: The short data type is a 16-bit signed two's complement integer. It has a minimum value of -32,768 and a maximum value of 32,767 (inclusive). Short int acquire 2 Byte of Space.

Int: The int data type is a 32-bit signed two's complement integer. It has a minimum value of -2,147,483,648 and a maximum value of 2,147,483,647 (inclusive). It require 4 Byte of Space.

Long: The long data type is a 64-bit signed two's complement integer. It has a minimum value of -9,223,372,036,854,775,808 and a maximum value of 9,223,372,036,854,775,807 (inclusive). Need 8 byte of Memory Space.

Float: The float data type is a single-precision 32-bit IEEE 754 floating point.

Double: The double data type is a double-precision 64-bit IEEE 754 floating point.

Boolean: The Boolean data type has only two possible values: true and false. Use this data type for simple flags that track true/false conditions.

Char: The char data type is a single 16-bit Unicode character. It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535 inclusive).

Implicit and Explicit Conversion

A Conversion performed by the compiler without the intervention of the programmer (Performed Automatically) is called implicit Conversion. A conversion performed or defined by the user is known as Explicit. For e.g. `int a,b,c; float c=a+b;`

Reference Data Types

These are constructed by using primitive data. These are constructed by using primitive data types, as per user need. Reference data types, as per user need. Reference data types store the memory address of an object. Class, store the memory address of an object. Class, Interface and Array are the example of Interface and Array are the example of

- ✚ Swing API includes graphical components for building GUIs.
- ✚ Swing components can be either container or non-container component.
- ✚ Swing provide seven different Layout manager.
- ✚ The part of program where a variable is used, called scope of a variable.
- ✚ Frame is a top level window with a title and a border, created through `JFrame` component of Swing.
- ✚ Common properties of buttons are: background, border, font, foreground, enabled, Horizontal Alignment, Vertical Alignment.
- ✚ Label control displays text that the user cannot change directly.
- ✚ Label is created through `JLabel` class component.
- ✚ TextField is created through `JTextField` class component.
- ✚ Password field takes input without showing it on the screen, created through `JPasswordField` class component.
- ✚ TextArea is multiline component to display or enter text, created through `JTextArea` class component.
- ✚ Checkbox is a rectangular area that can be checked or unchecked created through `JCheckBox` class component.

Block:

A group of statement enclosed in pair of parenthesis `{ }` is called block or a compound statement.

If Statement:

If statement helps to execute a block of statement based on the result of a condition. If the condition set evaluates to true on block of statement is executed otherwise another block is executed.

Syntax:

if (Expression or condition)

{

Statement 1;

}

else

{

Statement 2;

}

‘else’ part of ‘if statement’ is optional, if the user doesn’t provide an else part and the condition evaluates to false, then nothing would happen. Compiler will not produce an error in this case.

Switch Statement:

A Switch statement is used execute a statement from a group of statement based on the result of a expression. The expression must result in either of byte, short, integer or character.

Syntax:

switch(Expression)

{

case 1:

statement(s);

break;

case 2:

statement(s);

break;

case n:

statement(s);

break;

default:

statement(s);

}

The default statement is executed when none of the above mention case matches with the result of the switch expression. Default is optional.

Loop/Iteration:

Loop or iterations statement helps to repeat a group of statements number of times under a condition. Java supports two kind of Loop.

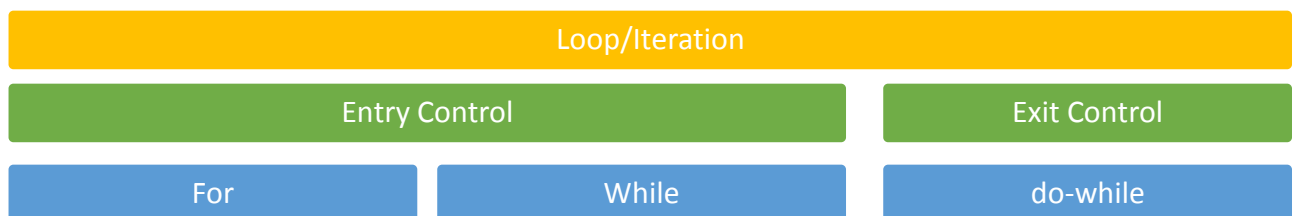
1. Entry Control Loop

a. While Loop

b. For Loop

2. Exit Control Loop

a. Do-while Loop



Entry control loop/ Pre-Tested loop:

As its name suggest, these are the type of loop, which check the condition first or entry level. If the condition is found true the loop body is execute, otherwise the loop terminates. In case if the condition is false the loop will skip out from the body.

While loop: It is an entry control loop

Syntax:

Initialization;

while (condition)

{

statement(s);

increment/decrement;

}

for loop: It is a compact entry control loop, which all the tree parts of the loop (i.e. initialization, Checking of Condition, and increment/decrement of the counter variable) exists in a single line.

Syntax:

for(initialization ; condition testing ; increment/decrement)

{

Statement(s);

}

It is to be noted that all the parts of the loop in the above statement are optional. In case if a programmer wants to specify more than one initialization or increment/decrement then it has to be separated by (,).

`for(int i=1; i<= 10; i++)`

`for(i=1, j = 10; i<j; i++, j++) // more than one initialization or increment/decrement` `for(i = 10, j= 20; i>= 1 && j<= 30 ; i-- , j++) // more than one condition joined using &&` `for(; i<= 10; i++) //initialization missing still using ;`

`for(; i<= 10;) //initialization, inc./dec. missing still using ;`

Exit control loop / Post-Tested loop:

An exit control loop first executes the loop body and then test the condition. If the condition is found true the loop body executed again otherwise the loop terminates. If the condition is false in first instance then the loop will get execute at-least once.

do while loop: it is a exit control loop

Syntax:

Initialization;

Do

{

Statement(s);

}

While (condition);

Jump Statement:

Java supports three type of jump statement. These statements transfer control to other part of the program.

Return: To return from a function.

Break: It is used to terminate the body of while, do-while, for or switch statement and transfers control to the statement following the body.

Continue: It skips the rest of the loop (while, do-while or for) and starts the next iteration.

Commonly available Swing Controls in Java:

jFrame: A Frame is a container control, in which all the controls can be place.

jLabel: JLabel allows placing un-editable text on the Frame/Panel

jTextField: JTextField allows placing editable text on the Frame/Pane. User can enter

text in a textFiled during runtime.

jbutton: is used to initiate an action when it is clicked.

jList: is a group of values or items from which one or more selections can be made.

jComboBox: jComboBox is similar to jList but also allow to enter editable text during run time. It is a combination of jTextFiled and jList.

jPanel: Act like a frame, to group one or more controls.

jRadioButton: Allow us to choose a single item from a group of jRadioButton options.

jCheckBox: Allow us to choose one or more items from a group of jCheckBox options.

jPasswordField: Allow us to enter a text during the run time but shows an encrypted text instead of the original text

jTextArea: JTextArea is a multi-line text component to enter or edit text.

Libraries: It is a set of ready-made software routines that can be reused in new programs.

Libraries are made available in a program using import statement e.g. import java.io.*;

String Library: It is a part of java language library java.lang, which is by default imported to the program. **There are 3 classes to work with characters:**

Character Class whose instances can hold single character data.

String Class whose instances can hold unchanging string. Every time we change, a new object is created automatically. String s = "Excellent" ; or String s = new String("Excellent");

StringBuffer Class whose instances can hold mutable strings. StringBuffer sb = new StringBuffer(); or StringBuffer sb = new StringBuffer("First"); or

StringBuffer sb = new StringBuffer(10); // to hold 10 characters

String s = "crack", r = "rack";

Method Prototype

Description

String toString() r = s.toString(); **//Returns the string itself.**

String concat(String) Concats two strings. s = s.concat(r); **// crackrack**

str1 + str2 Concatenation operator. s = s + r ;

int length() n = s.length() **//5**

String toLower Case() r = s.toLowerCase();

String toUpperCase() r = s.toUpperCase();

String trim() r = s.trim(); Removes white spaces from both ends.

String substring(int beginindex, int endindex) s.substring(1,3); **// ra**

Inclusive of start index and exclusive of end index. Index starts at 0.

boolean equals(str) b = s.equals(r);

Boolean equalsIgnoreCase(str) b = s.equalsIgnoreCase(r);

String.valueOf(all types)

`r = s.valueOf(r);` //Returns string representation of passed argument i.e. 30 is returned as "30".

valueOf()

`int i = Integer.valueOf(k);` //Returns Integer representation of passed argument i.e. "30" is returned as 30.

`double x = Double.valueOf(k);` //x becomes 30.0

`String s = "art", r = "science";`

`StringBuffer sb = new StringBuffer(s);`

Additional stringBuffer Methods:

Method Prototype

Description

`append(x)`

Adds x char at the end. `sb.append(r);` ==>> artscience.

`reverse()`

`sb.reverse();` ==>> ecneicstra

Sample

Questions and Answers

Q 1. Name any two Object Oriented Programming languages?

Ans. C++ and Java

Q 2 What does getPassword() on a password field return?

A. A string

B. An integer

C. A character array

Q 3 which of the following component is the best suited to accept the country of the user?

A . List

B. Combo box

C. Radio button

D . Check box

Q 4 What command do you need to write in actionPerformed() event handler of a button, in order to make it exit button?

A . `System.out.println();`

B . `System.exit(0);`

C. `System.out.print()`

Q 5 What method would you use, in order to simulate a button's (namely Okbutton) click event, without any mouse activity from user's side?

- A. Okbuttonn.setText()
- B. Okbutton.getText()
- C. **Okbutton.doClick()**

Q 6 Which control displays text that the user cannot directly change or edit?

- A. TextField
- B. Checkbox
- C. Combobox
- D. **Label**

Q 7 Which control provides basic text editing facility?

- A. **TextField**
- B. Checkbox
- C. Combobox
- D. Label

Q 8 Occurrence of an activity is called:

- A. Function
- B. Class
- C. Object
- D. **Event**

9 Which property is used to set the text of the Label?

- A. Font
- B. **Text**
- C. Name
- D. icon

Q 10 The object containing the data to be exhibited by the combo box by which property.

- A. Editable
- B. **Model**
- C. selectedIndex
- D. selectedItem

Q 11 What is GUI programming?

Ans: A GUI (Graphical User Interface) is an interface that uses pictures and other graphic entities along with text, to interact with user.

Q 12 How is swing related to GUI programming?

Ans: We can create a GUI application on Java platform using Swing API (Application Programming Interface), which is part of Java Foundation Classes (JFC).

Q 13 What is an event? What is event handler?

Ans: An event is occurrence of some activities either initiated by user or by the system. In order to react, you need to implement some Event handling system in your Application. Three things are important in Even Handling-

Event Source: It is the GUI component that generates the event, e.g. Button.

Event Handler or Event Listener: It is implemented as in the form of code. It receives and handles events through Listener Interface.

Event Object or Message: It is created when event occurs. It contains all the information about the event which includes Source of event and type of event etc.

Q 14 What is the default name of action event handler of a button namely jnvBtn?

Ans: private void jnvBtnActionPerfomed(java.awt.action.ActionEvent evt){ }.

Q 15 Which property would you set to assign access key to a button?

Ans: mnemonic property is used to assign access key or shortcut (Alt + Key).

Q 16 Which method can programmatically performs the click action of a push button?

Ans: private void TestBtnActionPerfomed(java.awt.action.ActionEvent evt){ }.

Q 17 Which property would you set the setting the password character as ‘\$’?

Ans:echoChar

Q 18 Which method returns the password entered in a password field?

Ans: char [] getPassword().

Q 19 Which list property do you set for specifying the items for the list.

Ans: model

Q 20 Which method would you use to determine the index of selected item in a list?

Ans: int getSelectedIndex().

Q 21 Which method would you use to insert an item at specified index, in the list?

Ans: void setSelectedIndex(int index).

Q 22 How you can determine whether 5th item in a list is selected or not?

Ans: isSelectedIndex(4).

Q 23 Which method you would use to insert ‘Hello’ at 10th position in the Text Area control.

Ans:void insert(“Hello”, 9).

Q 24 Which method you would like to use to insert an Icon (picture) on a Push Button.

Ans: void setIcon(Icon).

Q 25 Which property would you like to set to make a Combo box editable?

Ans: editable.

Q 26 What is Layout Manager? Name the layout managers offered by NetBeans?

Ans: Layout managers enable you to control the way in which visual components are arranged in GUI forms by determining the size and position of components within containers.

There are seven types of layout–

- A. Flow Layout
- B. Grid Layout
- C. Card Layout
- D. Spring Layout
- E. Border Layout
- F. GridBag Layout

G. Box Layout

Q 27 Name three commonly used properties and methods of the following controls.

- A. Text Field
- B. Text Area
- C. Check Box

Ans: A) Properties: text, font, editable.

Methods: void setText(), String getText(), void setEditable(boolean).

B) Properties: enabled, editable, wrapStyleWord

Methods: setText(), getText(), isEditable()

C) Properties: font, text, selected .

Methods: getText(), isEnabled(), isSelected().

Q 28 What is dispose() used for ?

Ans: dispose() is used for hide and dispose of the frame when the user closes it. This removes the frame from the screen and frees up any resources used by it.

Q 29 Why is java called a platform independent language?

Ans Java program can be easily moved from one computer system to another, anywhere anytime. Changes and upgrade in operating system, processors and system resources will not force any change in the Java program. Hence it is called a platform independent language.

Q 30 Elaborate the java Compilation process.

Ans The source program is first converted into a **byte code** using a java compiler. This byte code is machine independent i.e. same for all the machines. Later the byte code is executed on the machine using an interpreter.

Q 31 Why do we write a comment in a program? What are the two ways of writing comment in a java Program?

Ans. Comments are added to make the program more readable and understandable. There is two category of comments.

// -Single Line Comment

/**/ - Multiple Line Comment

Q 32 What is a syntax error in context of a program? Give an example.

Ans. Error in (Identifier) the way of writing a statement in a program, results in a syntax error. For e.g. for (i=0, i<=100, i++) will result in a (underline) syntax because the program has written comma instead of a semi comma in the for loop.

Q 33 What is RAD programming? Why program development in java using Netbeans IDE is is RAD?

Ans. RAD stands for **R**apid **A**pplication **D**evelopment. A programming style which aims at building programs fastly through the use of readymade tools and wizards is called RAD.

Program development using Netbeans IDE is RAD as it provide GUI environment and error during design time.

Q 34 What is IDE? Name two IDE for Programming in java.

Ans. A programming environment, where all the tools required for programming are available on single platform is called IDE. Two IDE for Java are Netbeans and BlueJ.

Q 35 Name any two type of Tokens available in Java.

Ans. Keyword, Identifier, Literal, Punctuators ad Operators.

Q 36 What are primitive data types? Name the various primitive data type available in Java.

Ans. Visit Page No. 21

Q 37. What are Reference data types?

Ans. Visit Page No. 21

Q 38. What is type casting?

Ans. Converting a value form one type to another is called type casting. For e.g. int a = 5 . here 'a' is a integer, which can be cased to float as follows float b = (float) a;

Q 39. Name and explain the usage of any two data types used in Java to store numbers with decimals.

Ans. Two data types available in java for storing numbers with decimals are float for single precision floating point value and double for double precision point.

Q 40. What are Keywords? Give two examples of keywords available in Java.

Ans. Keywords are words that have a specific predefined meaning in any language. The Keyword can't be used as variable names.

Q 41. Name and explain the usage of any one relational and one logical operator in Java.

Ans. In Java there is basically six type of Relational Operator (>,<,>=,<=,==,!=). Relational operator are used to compare the value of operands.

In Java logical operator (&&,!|,||) are used to combine more than two expression. AND (&&) operator is used to compare more than two expression, if all the expression are true, than result is also true, otherwise it return false.

Q 42. What is the difference between = and == operator in java?

Ans. The equal (=) operator is used to assign a value to a operand. It sets the value of the variable on its left side with the result of expression on its right side. Equal to (==) represent a conditional equal to operator. It checks for the equality of both its operands. If both the operands are equal, condition evaluates to true otherwise to false.

Q 43. Name the two type of selection statement available in Java.

Ans. Two selection statement available in java are 'if' and 'Switch'

Q 44 Write the purpose of Switch Statement with the help of an example. Which Java Statement can be used in place of switch statement?

Ans. A Switch statement is used to execute a statement from a group of statement based on the result of a expression. The expression must result in either of byte, short, integer or character. An '*if statement*' can be used in place of switch statement.

Q 45 In the switch statement, what happens if every case fails and there is no default option?

Ans. In a *switch statement* if none of the statement satisfies and even there is no default case then nothing would happen. This would not result in any sort of error.

Q 46 What is the purpose of 'break' statement in java?

Ans. Break statement is the type of Jump Statement, which is used to terminate the current switch statement or the loop.

Q. 47 What is the purpose of 'continue' statement in java?

Ans. Continue is the other type of Jump statement, which can be used to skips the remaining part of the current loop and begins the next iteration of the loop.

Q 48 Differentiate the following-

- (a) Text field & Text area
- (b) Text field & password field
- (c) Radio Button & Check Box

Ans: (a) A **text field**'s text property can hold single line of text unless it is an HTML text. While a **text area**'s text can hold any number of lines of text depending upon its rows property.

(b) Though a **text field** and a password field can obtain a single line of text from the user, yet these are different. A **password field** displays the obtained text in encrypted form on screen while **text field** displays the obtained text in unencrypted form.

(c) **Radio Button**: A `JRadioButton` control belongs to `JRadioButton` class of Swing controls. It is used to get choices from the user. It is grouped control, so that only one can be selected at a time among them. Radio Button works in group, so that they must be kept in a `ButtonGroup` container control like so that only one can be selected at the same time.

Some features of `JRadioButton` control are-

- It can be used to input choices typed input to the application.
- Only one Radio button can be selected at a time.
- They must be kept in a Button Group container control to form a group.

Check box: A `JCheckBox` control belongs to `JCheckBox` class of Swing controls. It indicates whether a particular condition is on or off. You can use Check boxes to give users true/false or yes/no options. Check Boxes may work independently to each other, so that any number of check boxes can be selected at the same time.

Some features of `JCheckBox` control are-

- It can be used to input True/False or Yes/No typed input to the application.
- Multiple check boxes can be selected at the same time.

Q 49 What is the significance of following properties of a text area ?

A. `LineWrap`

B. `wrapStyleword`

Ans: (a) Defines Wrapping feature enable/disable

(b) Determines where line wrapping occurs. If true, the component attempts to wrap only at word boundaries. This property is ignored unless `linewrap` is set to true.

Q 50 What is the significance of a button group? How do you create a button group?

Ans: We must add a **ButtonGroup control** to the frame to group the check boxes by using `Button Group` property of the check box. By dragging `buttongroup` control from palette window.

Q 51 What do you understand by focus?

Ans: A Focus is the ability to receive user input/response through Mouse or Keyboard. When object or control has focus, it can receive input from user.



An object or control can receive focus only if its enabled and visible property are set to

true.

Most of the controls provides FOCUS_GAINED() and FOCUS_LOST() method in FocusEvent by the FocusListener. FOCUS_LOST() is generally used for validation of data.

You can give focus to an object at run time by invoking the requestFocus() method in the code. Ex. `textBox2.requestFocus();`

Q 52 What is meant by scope of a variable?

Ans: In Java, a variable can be declared anywhere in the program but before using them.

The area of program within which a variable is accessible, known as its scope.

A variable can be accessed within the block where it is declared.

Q 53 Find the output of the following code snippet written in java.

```
public static void main(String []args)
{
    long a=78345,s1=0,s2=0,r; while(a>0)
    {
        r=a%10;
        if (r%4==0) s1+= r;
        else s2+=r; a/=10;
    }
    System.out.println("S1 =" + s1); System.out.println("S2 =" + s2);
}
```

Ans.

Output:

s1= 12

s2= 15 Note: println will change the line for the output.

Q 54 Correct the errors in the following program segment written in JAVA. You are just required to write the corrected code, underlying the corrections made.

```
public Static Void Main (String [] args)
{
    Integer Nos = 100;
    while (Nos ==> 45)
    {
        If (Nos % 5 = 0); Nos+=10;
        otherwise Nos + = 20;
    }
}
```

Ans: **Corrected Code**

```
public static void main (String [] args)
{
    int Nos = 100;
    while (Nos >= 45)
    {
        if (Nos % 5 == 0)
            Nos += 10;
        else
            Nos + = 20;
    }
}

{
    int x=10; if (a>b)
    { int y=5;
    ..... Scope of x and y
    }
    else
    { int z=3;
    ..... Scope of z
    }
    .....
}
```

Q 55 Write the value of sum1 after execution of the following WHILE loop:

```
int i = 1, sum1 = 0;
while (i<10)
{
    sum1 =sum1+ i;
    i =i+2;
}
```

Ans. 25

Q 56 Rewrite the following program code using if else if statement.

```
String remarks;
int num = Integer.parseInt(jTextField1.getText());
switch (num)
{
    case 0: remarks = "You have not won any points.";
    break;
    case 1: remarks = " You have won one point";
```

```

break;
case 2: remarks = " You have won two points";
break;

default: remarks = " All the best"; }

```

Ans.

```

If(num=0)
remarks="You have not won any points";
else if (num=1)
remarks="You have not won one point";
else if(num=2)
remarks="You have not won two points";
else
remarks="All the best";

```

Q 57 Create a Java Desktop Application to find the incentive (%) of Sales for a Sales Person on the basis of following feedbacks:

Feedback	Incentive (%)
Maximum Sales	10
Excellent Customer Feedback Maximum Count	0 8

Note: that the sales entry should not be space. Calculate the total incentive as :Sales amount* Incentive. The feedback will be implemented in JCheckBox controls. Using a JButton's (Compute Incentive) click event handler, display the total incentives in a JTextField control. Assume the nomenclature of the swing components of your own.

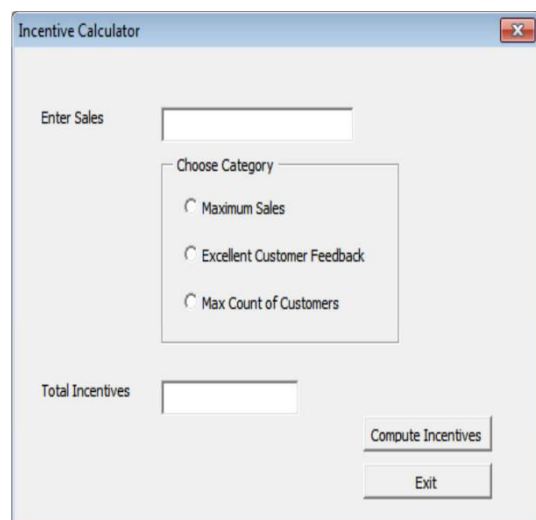
Note: The JFrame from IDE window will be shown as given:

Ans:-

```

private void btnIncActionPerformed
(java.awt.ActionEvent evt) { int sales = 0;
if (!txtSales.getText().trim().equals("")){
sales=Integer.parseInt(txtSales.getText().trim());
}
double incentive = 0.0;
if (jCheckBox1.isSelected ( )) { incentive =
incentive + 0.1;
}
}

```



```

if(jCheckBox2.isSelected ( )) { incentive = incentive + 0.8;
}
if(jCheckBox3.isSelected ( )) { incentive = incentive + 0.05;
}
txtInc.setText ( "" + Math.round(sales * incentive));
}

```

Q 58 Assume the following interface built using Netbeans used for bill calculation of a ice-cream parlor. The parlor offers three varieties of ice-cream – vanilla Rs. 30

--Strawberry Rs. 35

--Chocolate Rs. 50

A customer can choose one or more ice-creams, with quantities more than one for each of the variety chosen. To calculate the bill parlor manager selects the appropriate check boxes according to the varieties of ice-cream chosen by the customer and enter their respective quantities.

Icecream	Price	Qty	jLabel5
☐ Strawberry			
☐ Chocolate			
☐ Vinella			

Total Amount:

Write Java code for the following:

1. On the click event of the button 'Calculate', the application finds and displays the total bill of the customer. It first displays the rate of various ice-creams in the respective text fields. If a user doesn't select a check box, the respective ice-cream rate must become zero. The bill is calculated by multiplying the various quantities with their respective rate and later adding them all.
2. On the Click event of the clear button all the text fields and the check boxes get cleared.
3. On the click event of the close button the application gets closed.

Ans: (a)

```

private void jBtnCalculateActionPerformed(java.awt.event.ActionEvent evt)
{
    if(jchkStrawberry.isSelected()==true)
        jTxtPriceStrawberry.setText("35");
    else
    {
        jTxtPriceStrawberry.setText("0");
    }
}

```

```

jTxtQtyStrawberry.setText("0");
}
if(jChkChocolate.isSelected()==true)
jTxtPriceChocolate.setText("50");
else
{
jTxtPriceChocolate.setText("0");
jTxtQtyChocolate.setText("0");
}
if(jChkVinella.isSelected()==true)
jtxtPriceVinella.setText("30");
else
{
jtxtPriceVinella.setText("0");
jTxtQtyVinella.setText("0");
}
int r1,r2,r3,q1,q2,q3,a1,a2,a3,gt;
r1=Integer.parseInt(jTxtPriceStrawberry.getText());
r2=Integer.parseInt(jTxtPriceChocolate.getText());
r3=Integer.parseInt(jtxtPriceVinella.getText());
q1=Integer.parseInt(jTxtQtyStrawberry.getText());
q2=Integer.parseInt(jTxtQtyChocolate.getText());
q3=Integer.parseInt(jTxtQtyVinella.getText());
a1=r1*q1;
jTxtAmtStrawberry.setText(""+a1);
a2=r2*q2;
jTxtAmtChocolate.setText(""+a2);
a3=r3*q3; jTxtAmtVinella.setText(""+a3);
gt=a1+a2+a3; jTxtTotalAmt.setText(""+gt);
}

```

Ans.(b)

```

private void jBtnClearActionPerformed(java.awt.event.ActionEvent evt)
{
jTxtPriceStrawberry.setText("");

```

```

jTxtPriceChocolate.setText("");
jtxtPriceVinella.setText("");
jTxtQtyStrawberry.setText("");
jTxtQtyChocolate.setText("");
jTxtQtyVinella.setText("");
jTxtAmtStrawberry.setText("");
jTxtAmtChocolate.setText("");
jTxtAmtVinella.setText("");
jchkStrawberry.setSelected(false);
jChkChocolate.setSelected(false);
jChkVinella.setSelected(false);
}

```

Ans: (c)

```

private void jBtnCloseActionPerformed(java.awt.event.ActionEvent evt)
{
    System.exit(0);
}

```

Q 59 Read the following case study and answer the questions that follow. TeachWell Public School wants to computerize the employee salary section.

The School is having two categories of employees : Teaching and Non Teaching. The Teaching employees are further categorized into PGTs, TGTs and PRTs having different Basic salary. The School gives addition pay of 3000 for employees who are working for more than 10 years.

Employee Type	Basic Salary	DA (% of Basic Sal)	HRA (% of Basic Sal)	Deductions (% of Basic sal)
Non Teaching	12500	31	30	12
PGT	14500	30	30	12
TGT	12500	21	30	12
PRT	11500	20	25	12

(a) Write the code to calculate the Basic salary, deductions, gross salary and net salary based on the

given specification. Add 3000 to net salary if employee is working for more than 10 years.

Gross salary=Basic salary + DA + HRA

Net salary = Gross salary – deductions (b)Write the code to exit the application.

(c)Write the code to disable textfields for gross salary, deductions and netsalary.

Ans: (a)

```
double bs=0,da=0,net=0,ded=0,gross=0,hra=0; if(rdnnon.isSelected()==true)
{
bs=12500;
da=(31*bs)/100; hra=(30*bs)/100; ded=(12*bs)/100;
}
else if(rdpgt.isSelected()==true)
{
bs=14500;
da=(30*bs)/100; hra=(30*bs)/100; ded=(12*bs)/100;
}
else if(rdtgt.isSelected()==true)
{
bs=12500;
da=(21*bs)/100; hra=(30*bs)/100; ded=(12*bs)/100;
}
else if(rdppt.isSelected()==true)
{
bs=11500;
da=(20*bs)/100; hra=(25*bs)/100; ded=(12*bs)/100;
}
gross=bs+da+hra; net = gross – ded;
if(chk10.isSelected()==true)
{
net=net+3000;
}
tfded.setText(""+ded);
tfgross.setText(""+gross);
```

```
tfnet.setText(""+net);
```

```
tfbs.setText(""+bs);
```

Ans:(b)

```
System.exit(0);
```

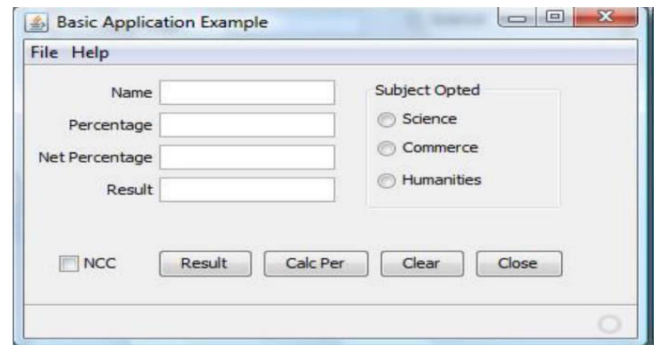
Ans:(c)

```
tfgross.setEditable(false);
```

```
tfded.setEditable(false);
```

```
tfnet.setEditable(false);
```

Q 60 ABC School uses the following interface built in java to check the eligibility of a student for a particular stream from science, commerce and humanities. The user first enters the total percentage and selects the desired stream by selecting the appropriate option button. An additional 5% is marks is given to students of NCC. Write Java Code for the following



- A. On Action event of the button 'Calc Percentage' Net percentage of the student is calculated and displayed in the appropriate text filed. Net percentage is same as that of the actual percentage if the student doesn't opts for NCC otherwise 5% is added to actual percentage.
- B. On Action event of the button 'Result', the application checks the eligibility of the students. And display result in the appropriate text field. Minimum percentage for science is 70, 60 for commerce and 40 for humanities.
- C. On the Click event of the clear button all the text fields and the check boxes get cleared.
- D. On the click event of the close button the application gets closed.

Ans: a.

```
private void jBtnCalcPerActionPerformed(java.awt.event.ActionEvent evt)
{
    int p; p=Integer.parseInt(jTextField2.getText());
    if(jCheckBox1.isSelected())
        p=p+5; jTextField3.setText(Integer.toString(p));
}
```

Ans b.

```
private void jBtnResultActionPerformed(java.awt.event.ActionEvent evt)
{
```

```

int p; p=Integer.parseInt(jTextField3.getText());
if(jRadioButton1.isSelected())
{
if ( p>=70)
jTextField4.setText("Eligible for all subject"); else
jTextfield4.setText("Not Eligible for science");
}
else if(jRadioButton2.isSelected())
if ( p>=60 )
jTextField4.setText("Eligible for Commerce and Humanities"); else
jTextfield4.setText("Not Eligible for Science and Commerce");
}
else
{
if ( p>=40 )
jTextField4.setText("Eligible for Humanities"); else
jTextfield4.setText("Not Eligible for any subject ");
}
}

```

Ans C

```

private void jBtnClearActionPerformed(java.awt.event.ActionEvent evt)
{
jTextField1.setText("")
jCheckbox1.setSelected(false);
}

```

Ans D

```

private void jBtnCloseActionPerformed(java.awt.event.ActionEvent evt)
{
System.exit(0);
}

```

Unsolved Questions

1. What will be output of the following code:

```
byte b;  
double d= 417.35; b= (byte) d;  
system.out.println(b);
```

2. Given the value of a variable, write a statement, without using if construct, which will produce the absolute value of a variable.

3. What is wrong with the following code fragment?

```
Switch (x)  
{  
case 1:  
n1= 10;  
n2= 20;  
case 2: n3=30;  
break; n4= 40;  
}
```

4. What will be the output of the following program code? int m = 100;

```
int n = 300; while(++m < --n);  
System.out.println(m+" "+ n);
```

5. What does the following fragment display

```
String s = "Six:" + 3+ 3; System.out.println(s);
```

6. What is the output of the following code?

```
String s = new string(); System.out.println("s = " + s);
```

7. What will be the output of the following code snippet? int x= 10;

```
int y = 20;  
if ((x<y)|| (x=5) > 10) System.out.println(x); else System.out.println(y);
```

8. State the output of the following program:

```
public static void main(String args[ ])  
{  
int x = 10; int y = 15;  
System.out.println((x>y)? 3.14: 3);  
}
```

9. State the output of the following program: public static void main(String args[])

```

{
int x = 10; float y = 10.0;
System.out.println((x>y)? true: false);
}

```

10. Given a package named EDU.student, how would you import a class named Test contained in this package? Write one line statement.

11. Consider the following class definition: Class Student

```

{
abstract double result( )
}

```

This code will not compile since a keyword is missing in the first line. What is the keyword?

12 An abstract method be declared final? Yes or No.

- Describe the relationship between properties, methods and events.
- What is container tag?
- What does a getPassword() method of a password field returns?
- What will be the contents of JTextArea1 after executing the following statement: 1
- JTextArea1.setText("Object\nOriented\tProgramming");
- What is difference between JRadioButton and JCheckBox?
- What does a JList fire when a user selects an item?
- What is Layout Manager? Discuss briefly about layout managers offered by NetBeans?
- Name three commonly used properties and methods of the following controls.
- (a) text field (b) text area (c) label (d) Check Box (e) button.
- Why dispose() is used for ?
- What is the difference between-

13 The FOR U SHOP has computerized its billing. A new bill is generated for each customer.

The Bill is generated on certain

Credit Card Type	Shopping Amount	Discount
Cash	< 10000	20 %
	>= 10000	25 %
Cheque	< 15000	10 %
	>= 15000	15 %
Credit Card	< 10000	10 %
	>= 10000	12%

condition with discount. Write down the code for the given condition.

A. Write the code for the CmdClear Button to clear all the Text Fields.

B. Write the code for the CmdCalc Button to display the Discount Amount and Net Price in the TxtDisc and the TxtNet Text Fields respectively.

14. What will be content of the JTextArea1 after executing the following code:

```
for (int i=2;i<=5;i++)  
{  
    JTextArea1.setText(JTextArea1.getText()+" "+ Integer.toString(i*i));  
}
```

15. Write java code that takes value for side of a square in jTextField1 and calculate area of it which is to be displayed in jTextField2.

16. Item code consisting of 5 digits is stored in a integer type variable intItemCode. Write the code for keeping this itemcode in a String type variable called strItemCode.

17. What message will be displayed after the execution of the following code?

```
int age =64, relaxation = 4; modiage= age – relaxation;  
if (modiage < 60)  
    JOptionPane.showMessageDialog(null, “Not Eligible”);  
else  
    JOptionPane.showMessageDialog(null, “Eligible”);
```

18. Rewrite the following program code using if statement:

```
int c = jComboBox1.getSelectedIndex();  
switch(c)  
{ case 0 : amount = bill; break;  
  case 1 : amount = 0.9 * bill; break;  
  case 2 : amount = 0.8 * bill; break;  
  default : amount = bill;  
}
```

GUI PROGRAMMING-II (JAVA)

In Java method or function is a sequence of some declaration and executable statements. In Java, which is strictly Object-oriented, any action can take place through methods and methods have to exist as a part of the class.

- Methods is a sequence of statements that carry out specific tasks.
- Methods returns a value through return statement.
- Class is a blue print for creating objects of a certain characteristics.
- Class contains fields and methods.
- Classes created through keyword class.
- Object is instance of a class created through new operator.
- Constructor is method with the same name as of that class it is used to initialize object of class.
- Constructor can either be parameterized or non-parameterized.
- The “this” keyword is used to refer to current object.

Points to Remember.

1. In java, methods reside in Class .
2. The number and type of arguments of a method are known as Parameter List. .
3. The first line of method definition that tells about the type of return value along with number and type of arguments is called prototype.
4. A member method having the same name as that of its class is called Constructor method.
5. A constructor method has no return type.
6. A Default constructor takes no arguments.
7. A Parameterized Constructor creates objects through values passed to it.
8. The keyword this refers to current object.
9. Primitive Type are passed by value in Java.
10. Reference Type are passed by Reference in Java.
11. Passing the address to a function is known as call by reference.
12. The public member of object are accessed through . (dot) operator.
13. The private members are accessible only inside their own class.
14. The protected members are accessible inside their own class, sub class and packages.
15. The default members are accessible inside their own class as well to classes in the

same package.

16. Related classes and interfaces are grouped together in the form of package.
17. Packages and class are imported through import command.
18. Public member of public class can be accessed by the same class, other class in the same package and also the class of other package.
19. A public member of private class can be accessed by same class only.
20. A package in java can be created by Package command.
21. A group of class is called package.
22. An ability to access the property of base class into derived is called inheritance.
23. A class from the property is accessed is known as base class.
24. A class in which property is accessed is called derived class.
25. Class, Object and inheritance are the three basic concept of OOPs.
26. Java supports (Single, Multiple and Hierarchical type) of inheritance.
27. A subclass constructor always calls the constructor for its superclass first explicitly or implicitly to create and initialize the subclass members.
28. To prevent a class from being inherited, keyword final is used.
29. `import javax.swing.*` is used to access the pane in java.
30. A static member of public class can be accessed by the class of same package.
31. In java all strings are called object.
32. A small separate window that appears to provide or request to/from the user is called Dialog.
33. Java swing provide four dialog (JDialog, JOptionPane, JFileChooser, JColorChooser)
34. Message Dialog, Input Dialog, Confirm Dialog and Option Dialog are the four built-in dialog styles

SOLVED QUESTIONS

1. Define a method. What is method prototype and signature?

Ans A message to an object is a call to the object's method requesting that it performs some specified action.

```
int absval(int a) {
return(a<0?-a:a);
}
```

The first line of the method definition is the prototype of the method i.e. the prototypes of method defined above is:

```
int absval(int a)
```

2. The String objects being reference types are passed by reference but changes, if any, are not reflected back to them. Why?

Ans The String objects are immutable in Java, which means once they are created, they cannot be changed. That is why, even though Strings are passed by reference, they cannot be changed.

3. At what time is the constructor method automatically invoked?

Ans Every time an object is created, the constructor method is automatically invoked.

4. Can you refer to a class as a composite type/ user-defined type?

Ans Yes, class is referred to as a composite type/user defined type.

5. How is a constructor invoked?

Ans A constructor is automatically called with a new operator in order to create a new object.

6. Which method of a class is invoked just once for an object and when?

Ans The constructor method is invoked for initializing values of the object at the time of its creation.

7. What's wrong with the following constructor definition for the class PlayInfo?

```
public void PlayInfo( int sticks)
nsticks = sticks;
}
```

Ans Return type has been declared with constructor.

8. How many values can be returned from a method?

Ans Only one value can be returned from a method though a method can have multiple return statements but only one gets executed which is reached first and thus returns the value.

9. What do you understand by Class and Object?

Ans The basic unit of OOP is the Class. It can be described as a blue print of Objects. In other words, an Object is an instance of a class. A JAVA program may have various class definitions. An Object is an entity having a unique Identity, characteristics (Properties) and Behavior (Methods).

10. How to declare a class in Java?

Ans In Java a Class is declared/defined by using class keyword followed by a class name. For example:

```
public class Student
{
String Name;
int RollNo;
String FName;
```

```

String DOB;
void getAdmission()
{.....
.....
}
id getTransfer()
{.....
.....
}
id feeDeposit()
{ .....
.....
}
}

```

11. What is the difference between instance and static variable?

Ans **Instance Variable**- These data member are created for every object of the class i.e. replicated with objects.

Class variable (static)- The data members that is declared once for each class and all objects share these members. Only a single copy is maintained in the memory. These are declared with static keyword.

12. What do you understand by constructor in OOP?

Ans A Constructor is a member method of a class, used to initialize an Object, when it is created (instantiated).

13. What are the properties of Constructor?

Ans A Constructor must have the same name as the class name and provides initial values to its data members.

- a. A constructor have no return type not even void.
- b. JAVA automatically creates a constructor method, if it is not defined with default values.

14. What do you understand by methods? What are the advantages of methods?

Ans **Definition**: A Method or function is sequence of statement which are written to perform a specific job in the application. In Object Oriented Programming, Method represents the behavior of the object. A message can be thought as a call to an object's method. The following three advantages/reasons describes that why we use methods.

When programs become more complex and big in size, it is best technique to follow "Divide

and conquer” i.e. a complex problem is broken in to smaller and easier task, so that we can make it manageable. Some time it is also called Modularization.

Hiding Details

Once a method is defined, it works like a Black-box and can be used when required, without concerning that “How it Works?”

Reusability of code

Once a method is implemented, it can be invoked or called from anywhere in the program when needed i.e. Method can be reused. Even a packaged method may be used in multiple applications. This saves our time and effort. Most of the method like Math.sqrt() is available as ready to use which can be used anywhere in the application.

15. How to define a method?

Ans A method must be defined before its use. The method always exist in a class. A Java Program must contain a main() method from where program execution starts. The general form of defining method is as-

```
[Access specifier]<return_type><method_name>(<parameter(s)>)
{.....;
body of the method i.e. statement (s);
}
```

 **Access Specifier**- It specified the access type and may be public or protected or private.

 **Return Type**- Specifies the return data type like int, float etc. Void is used when nothing is to be returned.

 **Method Name**- Specified the name of method and must be a valid Java identifier.

 **Parameters List** - It is list of variable(s), also called Formal Parameter or Argument, which are used to catch the values when method is invoked. Also a method may have no parameters.

16. What are the way to pass values to methods in Java?

Ans You can pass arguments (Actual parameters) to method (Formal Parameters) using valid data types like int, float, byte, char, double, Boolean etc. or Reference data type like Object and Arrays. A method can called in two ways –

 **Call by Value** - In this method, the values of Actual parameters are copied to Formal parameters, so any changes made with Formal parameters in Method’s body, will not reflected back in the calling function. The original value of Actual parameters is unchanged because the changes are made on copied value.

 **Call by Reference** - In Reference method, the changes made on the formal parameters are reflected back in the Actual parameters of calling function because instead of values, a

Reference (Address of Memory location) is passed. In general, all primitive data types are passed by Value and all Reference types (Object, Array) are passed by Reference.

17. What is Method Overriding?

Ans Base class has a method with same signature as in sub class the method of subclass overshadows the method of base class, it is called Method overriding.

18. What is the meaning of Method Overloading?

Ans Two methods with same name but different signatures are there in the same scope of program.

19. What is Abstract Class?

Ans The class that is used as only base class, no object of this class is used in the program.

20. Differentiate between constructor and method.

Ans Constructor are member method of the class like other methods, but they are different from other method members-

- ✚ Constructor creates (initializes) an Object where a method is a group of statements which are packaged to perform a specific job.

- ✚ Constructor has no return type, even void also. Whereas method may have any return type including void.

- ✚ The Constructor has the same name as Class, but method may have any name except Class name.

- ✚ It is called at the time of object creation, but a method can be called any time when required.

21. What is “this” keyword?

Ans As you are aware that static data and method members of a class is kept in the memory in a single copy only. All the object are created by their instance variables but shares the class variables (static) and member methods.

public class test

{ int x, y; static int z;

static method1()

{.....} static method2()

{.....}

}

Suppose method2() is changes X data member, then big question arises that which object's x variable will be changed?

This is resolved by using 'this' keyword. The keyword 'this' refers to currently calling object. Instead of using object name, you may use 'this' keyword to refer current object.

Ex. **this.method2()**

22. How can we use a class as a composite data type?

Ans Since a class may have various data members of primitive data types like int, float, long etc. In general class may be assumed as a bundle of primitive data types to make a user-defined composite data type.

// use of class as composite data type class date

```
{ byte dd, mm, yy;
public date( byte d, byte m, byte y)
{ dd= d; mm= m; yy= y;
} v
oid display()
{system.out.println(""+dd+""+"/"+mm+""+"/"+yy);
}
};
date DOB = new date(13,2,1990);
```

23. In Java, all strings are objects?

- A. True
- B. False
- C. don't say

24. What will be the output of the following code `StringBuffer city = new StringBuffer("Haryana");`

```
StringBuffer string = new StringBuffer();
string.append(new String(State));
string.insert(0,"North");
string.out.println(string);
```

Ans NorthHaryana.

25. Give the output of the following program:

```
class MainString
{ public static void main( String agrs[])
{
StringBuffer s = new StringBuffer("String");
if(s.length() > 5) && (s.append("Buffer").equals("x"));
System.out.println(s);
}
}
```

Ans StringBuffer.

26. What is the output of the following code fragment if “Radhey” is passed as argument to the func()?

```
public static void func(string s1)
{
    String s = s1 + “Shyam”;
    System.out.println(“s1=” + s1);
    System.out.println(“s = “ + s);
}
```

Ans s1= Radhey

s =RadheyShyam

27. What are the access specifiers in Java? Explain.

Ans Access specifiers control the access to data members and member function of class. Java supports four type of access specifiers.

Private : A variable or method declared as private, may not be accessed outside of the class. Only class member can access them, since they are private to others.

//e.g to demonstrate private specifier.//

```
{ private int p;
private void method1()
{ p=10;
system.out.print(“I am Private method”);
}
}

class xyz
{.....
void method2()
{ abc x = new abc();
x.p =10; x.method1();
}
}
```



Protected: Protected members can be accessed by the class members and subclasses (derived classes) and current package, but they are not accessible from beyond package or outside.

Package mypackage; class abc

```
{ protected int p; protected void method1()
```

```

{ p=10;
system.out.print("Protected method");
}
}

```

```

class xyz
{.....
void method2()
{ abc x = new abc();
x.p =10; x.method1() ;
}
}

```

Lets another Package... package yourpackage; import mypackage.*; class pqr extends abc

```

{ void method3()
{ abc x=new abc(); pqr y=new pqr(); x.p=10;
x.method1(); y.p=10;
y.method1();
}
}

```

 Public: Class members declared as public, are accessible to any other class also

packagemypackage; class abc

```

{ public int p;
public void method1()
{ p=10;
system.out.print("Public method");
}
}

```

package yourpackage; import mypackage.* ; class xyz

```

{.....
void method2()
{ abc x = new abc();
x.p =10; x.method1() ;
}
}

```

🚦 Package (default): If no any specifier is mentioned, default or friendly access is assumed. Class member may be accessed by any other Class members available in the same package, but not accessible by the other classes outside the package, even subclasses.

```
package mypackage; class abc
{ int p;
void method1()
{ p=10;
system.out.print("Package method");
}
}
class xyz
{.....
void method2()
{ abc x = new abc();
x.p =10; x.method1() ;
}
}
```

28. What do you understand by Library in Java?

Ans A library is readymade and reusable component/codes that can be used in a program to perform predefined task.

🚦 Some commonly used Java libraries are Math Library, String Library, Utility Library and IO Library etc.

🚦 You can use import statement at the top of the program to include the Java libraries. import java.io.*;

🚦 The java.lang is the default imported library in your program without writing import statement.

String Library & its commonly used methods

1. boolean equals(str) - Compare this (current) string to given string and returns true if both are true otherwise false. e.g. boolean test=str1.equals(str2);

2. int compareTo(str1,str2) - Compare two strings in alphabetical order.

boolean equalsIgnoreCase(str) - Compare this string to given string but ignores case difference.

3. int length() -Returns the length of this string.

e.g. int x=str1.length();

Math Library & its commonly used methods

Java provides math library, which available under java.lang package.

In order to use functions/methods of math library, you need to invoke function using math keywords before the function.

e.g. `x=math.abs(-7.5);`

1. **pow(num1,num2)** - It computes num1 num2 , where num1 and num2 are numbers.

e.g. `system.out.print(""+math.pow(2,3);`

2. **round(num1)** - It rounds off a given number to its nearest integer. It can take float/double as argument.

e.g. `system.out.print(""+math.round(1.5));2`

`system.out.print(""+math.round(-1.5));-1`

Using Dates & Times in JAVA

Java offers two classes in java.util package to manipulate date and time.

1. java.util.Date
2. java.util.Calendar

In order to use Date & calendar, you need to import java.util package. E.g. `import java.util.*;`

Date d=new Date(); -It returns system date in the given format. Sat Oct 17:30:22 GMT+05:30 2017

UNSOLVED QUESTIONS

- a. How are parameterized constructors different from non-parameterized constructors?
- b. List some of the special properties of the constructor methods.
- c. Differentiate between Instance member and static members of a class.
- d. What are the different types of access specifier supported by java?
- e. Which is the default package of java?
- f. What is friendly access of class member?
- g. How does a class enforce information hiding?
- h. Define an abstract class and abstract methods.
- i. What is an interface? What is the use of Interface?
- j. What do you mean by actual and formal parameters of a method? Explain with an example.
- k. Identify the errors in the method skeletons given below:
 - i. `float average (a, b) { }`
 - ii. `float mult (int x, y) { }`
 - iii. `float doer (int, float = 3.14) { }`

- l. Given the method below write an ActionPerformed event method that includes everything necessary to call this method.

```
int thrice (int x)
{
return (a * 3) ;
}
```

- m. Write Java code to assign the value 70 to variable y. Then decrease the value of y by 5 and store it in variable z.

- n. Write the output that will be generated by the code given below: (2)

```
int t;
int i;
for (i = 5; i <=10; i = i+5)
{
t = i+3;
System. out. Print ln( ""+t);
}
```

- o. Write Java code (statements) to declare Y as integer variable. Then, assign the value 30 to a variable Y. Increase the value of Y by 5 and store the increased value in Z.

World Wide Web is an example of an information protocol/service that can be used to send and receive information over the internet. It supports:

- Multimedia Information (Text, Movies, Pictures, Sound, Programs etc...)
- Hyper Text Information :(Information that contains links to other information resources)
- Graphical User Interface :(So users can point and click to request information instead of typing in text commands)

The World Wide Web is an example of an information protocol/service that works using a Client/Server software design. A service that uses Client/Server design requires two pieces of software to work: Client software (e.g. Web Browser) to request information, and Server software (Web server) to answer requests and provide their information. Most Web applications are designed this way.

POINT TO REMEMBER

1. HTML stands for Hyper Mark-up Language.
2. HTML tag always start with `<.....>` and end with `</.....>`.
3. HTML can be edited by using professional HTML editors like Microsoft WebMatrix, Sublime Text, Notepad (PC) or TextEdit (Mac).
4. Hypertext refers to the way in which a web page link to another web pages. Thus the link available on a webpage are called Hypertext.
5. `<!DOCTYPE...>` tag defines the document type and HTML version.
6. `<HEAD>` tag represents the document's header.
7. Container elements contain parameters and the parameters of an element are given between the start tag and end tags.
8. Empty elements have only a start tag and no end tag.
9. The `<HR>` tag creates a horizontal line from the current position in the document to the right margin
10. HTML is the subset of SGML (Standard Generalized Markup Language)
11. The head of the HTML document is where you enter the title of the page.
12. Headings are typically displayed in larger and/or bolder fonts than normal body text. HTML has six levels of heading, numbered 1 to 6, with 1 being the largest.

13. The BACKGROUND is the image attribute in <BODY> tag where you can place graphic object to make more attractive Web page.
14. The BGCOLOR attribute is used to set the background color of your Web page with <BODY> tag.
15. <MARQUEE> tag is used to scroll the text.
16. ,<I>,<U> tag are used for making the text Bold, Italic and Underline the text respectively.
17. tag with its attribute are used to make the text more stylish.
18. <Body Background> tag is used to set the background of the page.
19. A dynamic document is created by web server whenever a browser requests the documents.
20. A Static document is a fixed content document that is created by web server whenever a browser requests the documents.
21. Apache is a kind of web server software.
22. The address of a resource on the net is known URL (Uniform Resource Locator)
23. Web Server is a program that serves requested HTML files and pages.
24. The URL is the unique identifier of a web page. The URL is used to open the website in the "Address Bar" of the web browser.
25. Web server delivers content, such as web pages, using the **HyperText Transfer Protocol** over the World Wide Web.
26. Web browser is a client that initiates communication by making a request for a specific resource.
27. A dynamic document is created by web server whenever a browser requests the documents.
28. A static document is a fixed content document that is created by web server whenever a browser requests the documents.
29. (Ordered List) tag is used to get the number in the list. An ordered list is also a list of items. The list items are marked with numbers.
30. (Unordered List) tag is used to get the bullet in the list item.
31. (list) tag is used to denote the beginning of each new list item.
32. The TYPE attribute is used to change the bulleted symbol in a list e.g <OL type="A">.
33. The START attribute is used to change the beginning value of an ordered list. E.g. <OL START = 10>.
34. The tag is used to insert the image to be displayed in a Web page.
35. <Table Border> tag is used to insert the table border.
36. <TR> tag is used to insert the row in the table.

- 37. <TH> tag is used to create the Heading in Table.
- 38. <TD> tag is used to insert the Data in to the Table.
- 39. <TD Rowspan> is used to merge the number of Row in the table.
- 40. <TD Colspan> Is used to merge the number of Column in the table.
- 41. <CELLSPACING> attribute defines the width of the border.
- 42. <CELLPADDING> represents the distance between cell borders and the content within a cell.
- 43. A table is divided into rows (with the <tr> tag), and each row is divided into data cells (with the <td> tag).\ The letters td stands for “table data”, which is the content of a data cell.
- 44. Links between Web pages is known as hyperlink.
- 45. The anchor tag <A> marks the text as hypertext link.
- 46. <A HREF> tag is used to insert the link between the web page, image or text on the website.
- 47. **Align** right, left, center Horizontally aligns tags
- 48. **Valign** top, middle, bottom Vertically aligns tags within an HTML element.
- 49. **Width** Specifies the width of tables, images, or table cells.
- 50. **Height** Specifies the height of tables, images, or table cells.
- 51. <!--...--> Specifies a comment
- 52. <abbr> Specifies an abbreviation
- 53. <acronym> Specifies an acronym
- 54. <address> Specifies an address element
- 55. <applet> Deprecated. Specifies an applet
- 56. <area> Specifies an area inside an image map
- 57. <base> Specifies a base URL for all the links in a page
- 58. <basefont> Deprecated. Specifies a base font
- 59. <bdo> Specifies the direction of text display
- 60. <bgsound> Specifies the background music IE
- 61. <big> Specifies big text
- 62. <blink> Specifies a text which blinks NS
- 63. <blockquote> Specifies a long quotation
- 64. <body> Specifies the body element
- 65.
 Inserts a single line break
- 66. <button> Specifies a push button
- 67. <caption> Specifies a table caption
- 68. <center> Deprecated. Specifies centered text

- 69. <cite> Specifies a citation
- 70. <code> Specifies computer code text
- 71. <col> Specifies attributes for table columns
- 72. <colgroup> Specifies groups of table columns
- 73. <comment> Puts a comment in the document IE
- 74. <dd> Specifies a definition description
- 75. Specifies deleted text
- 76. <dfn> Specifies a definition term
- 77. <dir> Deprecated. Specifies a directory list
- 78. <div> Specifies a section in a document
- 79. <dl> Specifies a definition list as it displayed in Dictionary.
- 80. <dt> Specifies a definition term
- 81. Specifies emphasized text
- 82. <embed> Deprecated. Embeds an application in a document IE & NS
- 83. <fieldset> Specifies a fieldset
- 84. Deprecated. Specifies text font, size, and color
- 85. <form> Specifies a form
- 86. <frame> Specifies a sub window (a frame)
- 87. <frameset> Specifies a set of frames
- 88. <h1> to <h6> Specifies header 1 to header 6
- 89. <head> Specifies information about the document
- 90. <html> Specifies an html document
- 91. <iframe> Specifies an inline sub window (frame)
- 92. <ilayer> Specifies an inline layer NS
- 93. <input> Specifies an input field
- 94. <ins> Specifies inserted text
- 95. <isindex> Deprecated. Specifies a single-line input field
- 96. <kbd> Specifies keyboard text
- 97. <keygen> Generate key information in a form
- 98. <label> Specifies a label for a form control
- 99. <layer> Specifies a layer NS
- 100. <legend> Specifies a title in a fieldset
- 101. Specifies a list item
- 102. <link> Specifies a resource reference

- 103. <map> Specifies an image map
- 104. <marquee> Create a scrolling-text marquee IE
- 105. <menu> Deprecated. Specifies a menu list
- 106. <meta> Specifies meta information
- 107. <multicol> Specifies a multicolumn text flow NS
- 108. <nobr> No breaks allowed in the enclosed text
- 109. <noembed> Specifies content to be presented by browsers that do not
- 110. support the <embed> tag
- 111. <noframes> Specifies a noframe section
- 112. <noscript> Specifies a noscript section
- 113. <object> Specifies an embedded object
- 114. Specifies an ordered list
- 115. <optgroup> Specifies an option group
- 116. <option> Specifies an option in a drop-down list
- 117. <p> Specifies a paragraph
- 118. <param> Specifies a parameter for an object
- 119. <plaintext> Deprecated. Render the remainder of the document as
- 120. preformatted plain text
- 121. <pre> Specifies preformatted text
- 122. <q> Specifies a short quotation
- 123. <s> Deprecated. Specifies strikethrough text
- 124. <samp> Specifies sample computer code
- 125. <script> Specifies a script
- 126. <select> Specifies a selectable list
- 127. <spacer> Specifies a white space NS
- 128. <small> Specifies small text
- 129. Specifies a section in a document
- 130. <strike> Deprecated. Specifies strikethrough text
- 131. Specifies strong text
- 132. <style> Specifies a style definition
- 133. <sub> Specifies subscripted text
- 134. <sup> Specifies superscripted text
- 135. <table> Specifies a table
- 136. <tbody> Specifies a table body

- 137. <td> Specifies a table cell
- 138. <textarea> Specifies a text area
- 139. <tfoot> Specifies a table footer
- 140. <th> Specifies a table header
- 141. <thead> Specifies a table header
- 142. <title> Specifies the document title
- 143. <tr> Specifies a table row
- 144. <tt> Specifies teletype text
- 145. <u> Deprecated. Specifies underlined text
- 146. Specifies an unordered list
- 147. <var> Specifies a variable
- 148. <wbr> Indicate a potential word break point within a <nobr> section IE & NS
- 149. <xmp> Deprecated. Specifies preformatted text
- 150. A complete list of deprecated HTML tags and attributes are given here. All the tags have been
- 151. ordered alphabetically along with their equivalent tag or alternate CSS option.
- 152. Tag Description Alternate
- 153. <applet> Deprecated. Specifies an applet <object>
- 154. <basefont> Deprecated. Specifies a base font
- 155. <center> Deprecated. Specifies centered text text-align
- 156. <dir> Deprecated. Specifies a directory list
- 157. <embed> Deprecated. Embeds an application in a document <object>
- 158. Deprecated. Specifies text font, size, and color font-family, font-size
- 159. <isindex> Deprecated. Specifies a single-line input field
- 160. <listing> Deprecated. Specifies listing of items <pre>
- 161. <menu> Deprecated. Specifies a menu list
- 162. <plaintext> Deprecated. Specifies plaintext <pre>
- 163. <s> Deprecated. Specifies strikethrough text text-decoration
- 164. <strike> Deprecated. Specifies strikethrough text text-decoration
- 165. <u> Deprecated. Specifies underlined text text-decoration
- 166. <xmp> Deprecated. Specifies preformatted text <pre>
- 167. A markup language is a set of rules that defines the structure and format of text while presenting text.
- 168. **XML** stands for **eXtensible Markup Language**

- 169. XML is a markup language.
- 170. A meta-language is a language that is used to define other languages.
- 171. XML is based on SGML.SGML was the first markup language.
- 172. XML is different from HTML as it does not display the data but describes and carries it.
- 173. XML is free and extensible.
- 174. XML is platform independent.
- 175. The XML document that obeys XML grammar rule is called well-formed document.
- 176. DTD (**D**ocument **T**ype **D**efinition) is a set of rules that defines what tags appear in an XML document.
- 177. CSS (**C**ascading **S**tyl **S**heet) are a collection of forming rules that control the appearance of content in a webpage.
- 178. XML is a case sensitive language.
- 179. EDI-**E**lectronic **D**ata **I**nterchange
- 180. An XML document has a logical and physical structure.
- 181. SGML is the first generic markup language
- 182. XML is a case sensitive language.
- 183. DTD is a set of rules that defines what tags appear in an XML document.
- 184. Root Data enclose all other elements of an XML document.
- 185. XML documents can be viewed as web page properly if proper style sheet file is also available along with XML file.

186. The XML file confirming to syntax rules or grammar rules is called well-formed document
Elements of HTML: HTML is made up of elements called Tags and Attributes.

Tags: A tag is coded HTML command within angular <> bracket. It is not case sensitive. There are two types of tags Empty tags and Container tags.

Attribute: An Attribute is a special word used inside tag to specify additional information of tag such as color, alignment etc.

Container and Empty Tags: There are two types of Tags – one that requires a starting as well as ending tag and another that requires just a starting tag and not an ending tag.

Container Tag: A container tags requires starting tag and as well as ending tag. Example:
<Title>.....</Title>, <HEAD>.....</HEAD>

Empty Tag: Empty Elements have only a starting tag and no ending tag. e.g. <HR> inserts a horizontal rule and
 breaks a line.

Client Server Computing: Client server computing refer to a network setup in which program, documents and information reside on the server and client can connect with the server using

network to access the information. It is of two types:

Static Web Pages: Static Web pages display the exact information whenever anyone visits it, until you alter that page's source code.

Dynamic Web pages: Dynamic Web pages are capable of producing different content for different visitors from the same source code file. The website can display different content based on what operating system or browser the visitor is using, whether user is using a PC or a mobile device, or even the source that referred the visitor.

Examples:

Client side computing: Java script, VB Script.

Server side computing: ASP (Active Server Page), PHP (Personal Home Page), JSP (Java Server Page).

Logical and Physical Text Styles

HTML has two types of styles for individual word or sentences:

1. Logical Styles 2. Physical Styles

Logical Text: Logical text Styles are general descriptions. Each browser handles a logical style in its own way.

Physical Text Styles

Physical Text styles indicate the specific type of appearance for a section e.g. bold, italics etc.

Solved Questions:

1. Identify the web browser software from the following options:

(a) Apache Web Server (b) MS Word (c) HTML (d) **Mozilla Firefox**

2. What is Client Server Computing?

Ans It refers to a network set-up in which programs and information reside on the server and clients connect to the server for network access.

1. Give two differences between HTML and XML.

Ans: The three differences between HTML and XML are:

1. HTML is designed to display data and hence, focussed on the 'look' of the data, whereas XML is designed to describe and carry data and hence, focuses on 'what data is'.

2. In HTML tags are predefined, while in XML, tags can be created as per needs.

3. HTML tags are not case sensitive, whereas XML tags are case sensitive

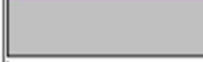
2. Important color Code for HTML 3.0

Color Name	Hex Value	Color
aqua	#00ffff	
black	#000000	
blue	#0000ff	
fuchsia	#ff00ff	
green	#008000	
gray	#808080	
lime	#00ff00	

maroon	#800000	
navy	#000080	
olive	#808000	
purple	#800080	
Red	#ff0000	
silver	#c0c0c0	
teal	#008080	
white	#ffffff	
yellow	#ffff00	

COLOR CODE WITH RGB VALUE

Color	Color RGB
	rgb(0,0,0)
	rgb(255,0,0)
	rgb(0,255,0)
	rgb(0,0,255)

	rgb(255,255,0)
	rgb(0,255,255)
	rgb(255,0,255)
	rgb(192,192,192)
	rgb(255,255,255)

3. What is Cookies?

Ans. Cookies are data, stored in small text files on your computer and it is exchanged between web browser and web server to keep track of various information based on your web application need. You can use tag to store cookies on client side and later this information can be used by the Web Server to track a site visitor.

4. What is an unordered list?

Ans Bulleted/unordered list tag is used to indicate a list item as contained in an unordered or bulleted form.

5. What is ordered list?

Ans The numbered/ordered list tag is used to indicate a list item as contained in an ordered or numbered form.

6. What is table? What are the basic commands for creating a table?

Ans: Table is a collection of rows and column.

<Table border> :- used to give identification to a table along with border.

<TH> :- To provide headings in a table.

<TR>:- (Table Row) to insert a new row in a table.

<TD> :- (Table Data) to enter data in to the columns.

7. What do you understand by ALINK? Explain with an example.

Ans: Links which are currently being visited in web page are known as Active Links (ALINK).

```
<BODY TEXT = "#FFFFFF" ALINK="#FF0000">
```

```
<A HREF="www.nvshq.org"> Navodaya Vidyalaya Samiti </A>
```

```
<A HREF=" www.cbse.nic.in"> Central Board of Secondary Education </A>
```

```
</BODY>
```

8. What is FORM tag? Explain with example.

Ans: To create or use forms in a web page <FORM> tag is used. Form is means to collect data from the site visitor. It is done with the help of controls that collect data and send it over.

```
<FORM method = "POST" action=submitform.asp>
```

HTML Forms

HTML forms are means to collect information / data from the site-visitor or client. It is done with the help of controls that collect the information and send it over. Forms contain some GUI controls to interact with users.

Some of the important controls are:-

- Button
 - Submit button
 - Reset button
 - Push button
- Checkboxes
- Radio Button
- Combo boxes
- Password

9. What is INPUT tag? Explain with example.

Ans: Text boxes are single line text input controls that are created using <INPUT> tag whose TYPE attribute has a value as "Text".

```
<Input Type="Button", name="OK", value="OK"> used to create the clickable button.
```

```
<Input Type="reset", name="reset", value="reset"> used to create the clickable reset Button.
```

```
<Input Type="Field Type", name="Field Text", value="Enter your Name"> used to create the Text Field.
```

```
<Input Type="radio", name="Sex", value="Female"> used to create the Radio button.
```

```
<Input Type="Button",name="OK", value="OK"> used to create the clickable button.
```

10. What is the purpose of select tag?

Ans: <SELECT> tag is used to create a drop down box in which many options are available; user can make selection from the list.

Example:

```
<SELECT name = "stream">
<OPTION value="Science"> Science</OPTION>
<OPTION value="Commerce"> Commerce </OPTION>
<option value="Humanities"> Humanities </OPTION>
</SELECT>
```

Unsolved Questions:

1. What types of list are supported by HTML?
2. Which three tags let you create the definition list?
3. Which three tags let you create the (i) unordered lists (ii) Ordered lists
4. What is a table? Which tag is used to create tables in HTML?
5. Which attributes are used to give border to a table?
6. Which attribute lets you control the display of select border sides of a table?
7. Which attributes is used to control the inside table border?
8. How is spacing in cells of table controlled?
9. What is the role of ALIGN attribute of <TABLE> tag?
10. How can you specify following in table?

(a) background image	(b) background colour.
(c) Table height.	(d) Table width.
11. What tag is used to specify

(i) Table data (ii) Table header (iii) Table row?	
---	--
12. Name the attributes used for following?

(i) Setting the cell width.	(iii) Setting cells background colour.
(ii) Changing the cell span.	(iv) Aligning cell contents vertically.
13. What for are <TH> and <TR> tags used?
14. What are forms? Which methods and actions are commonly used with Forms?
15. Name different control types supported by HTML forms.
16. Write the tags to define the following :

(i) A text box	(ii) A text area	(iii) A radio button
(iv) A check box	(v) A Password box	(vi) A Pop up box

(vii) Submit button (viii) A label.

17. How will you insert an un order list inside an ordered list?

18. How would you indent a single word and put a square bullet in front of it?

21. Write HTML code to produce these controls

(i) a text box

(ii) a text area with 10 rows and 30 columns

(iii) A password text box

(iv) A pop up box to choose class from it.

POINTS TO BE REMEMBER

1. **JDBC**-Java Database Connectivity
 2. **ODBC**- Open Database Connectivity
 3. A Connection is the session between the application program and the database.
 4. Database is a collection of interrelated file.
 5. Database help the user to save the data permanently in a useful manner.
 6. Database provide the facility to access the data to make it more meaningful.
 7. To perform the operation on database user must aware with SQL Command like create, alter, modify, add, update and delete etc.
 8. Insert- To insert a new row in to the table.
Insert into student values (1,'Ramesh Kumar','Ram Singh',2345);
 9. Update- To update the existing value.
Update student set marks=marks+5;
 10. Alter- To Add/Delete/Modify the structure of the table.
 11. Front End- Front end is the platform for user, where a user can interact with the application.
 12. Back End- Back End is the nothing, actually the place to store the data the data physically.
 13. JDBC API- (**J**ava **D**atabase **C**onnectivity **A**pplication **P**rogramming **I**nterface)
 14. API provide interaction between different software programs.
 15. executeQuery()- For SQL statements that produce a single result set (like simple SQL query).
 16. executeUpdate()- For executing INSERT,UPDATE OR DELETE statements and also SQL DDL(Data Definition Language) statements.
- Driver Manager Class,
 - Connection Class,
 - Statement Class,
 - ResultSet Class

Prerequisites for connecting to MySQL from Java

MySQL provides connectivity for client applications developed in the Java Programming

language via a JDBC driver known as MySQL Connector/J

Connection:

A connection is the session between the application program and the database. To do anything with database, one must have a connection object.

Steps to be follow to Connect with MySQL from Java

- i. Import the Packages Required for Database Programming.
- ii. Register the JDBC Driver
- iii. Open a Connection
- iv. Execute a Query
- v. Extract Data from Result set
- vi. Clean up the Environment

To connect with database, get the Complete URL, along with user ID and Password. E.g
 Jdbc:mysql://localhost/<name of the database>/user="username" & password="password"

ResultSet Methods

A result set (represented by a ResultSet object) refers to a logical set records that are fetched from the database by executing a query and made available to the application –program. There are various resultSet methods such as:

- next() -moves the cursor forward on row.
- first() -moves the cursor to the first row in the ResultSet Object.
- Last() -moves the cursor to the last row in the ResultSet object.
- relative(in rows) -moves the cursor relative to its current position.
- Absolute(int rno) -positions the cursor on the rno-th row of the ResultSet object.
- getRow() -Retrieves the current row number the cursor is pointing at. That is if cursor is at first row the getRow() will return 1.

SOLVED QUESTIONS:

1. What is the importance of java.sql.*. in java jdbc connection?

Ans The java.sql.package has to be imported first before we can create a java jdbc connection to the database.

2. What is DriverManager?

Ans DriverManager a class of java.sql package that controls a set of JDBC drivers. Each driver has to be registere with this class.

3. What is the purpose of connection.close() method?

Ans This method is used for disconnecting the connection. It frees all the resources

occupied by the database.

4. Name the four components of JDBC.

Ans JDBC consists of four components:

1. JDBC API
2. JDBC Driver Manager
3. JDBC Test Suite
4. JDBC-ODBC Bridge.

5. What are the steps involved in establishing a connection?

Ans To establishing a connection we need to follow two steps **loading the driver** and **making a connection**.

6. What is ResultSet ?

Ans A result set (represented by a ResultSet object) refers to a logical set of records that are fetched from the database by executing a query and made available to the application program.

7. What type of parameter that used in executeQuery() method?

Ans The executeQuery() method has a single String parameter. This parameter must be a valid SQL command.

8. What is Connection? What is its role?

Ans A Connection (represented through Connection object) is the session between the application program and the database. To do anything with database, one must have a connection object.

9. What is JDBC? What is its basic functionality?

Ans The JDBC API defines interfaces and classes for writing database applications in Java by making database connections. Using JDBC we can send SQL statements to almost any relational database. JDBC is a Java API for executing SQL statements and supports basic SQL functionality. It provides RDBMS access by allowing us to embed SQL inside Java code. Because Java can run on a thin client, applets embedded in Web pages can contain downloadable JDBC code to enable remote database access.

10. What is the JDBC-ODBC Bridge?

Ans The JDBC-ODBC Bridge is a JDBC driver which implements JDBC operations by translating them into ODBC operations. To ODBC it appears as a normal application program. The Bridge implements JDBC for any database for which an ODBC driver is available. The Bridge is implemented as the sun.jdbc.odbc Java package and contains a native library used to access ODBC.

11. Explain the purpose of DriverManager.

Ans The DriverManager looks after the managing the drivers for a JDBC application. When it is instantiated it makes an attempt to load the driver classes. When the method getConnection() is invoked, the driver manager attempts to locate the suitable driver. The DriverManager obtains the information about the drivers such as registering, locating, finding the drivers loaded, setting the time to wait when it tries to get the connection to a database.

Unsolved Questions:

1. Differentiate between JDBC and ODBC ?
2. What are the main tasks of JDBC ?
3. What are the various steps involved in establishing a JDBC connection?
4. Name the method used to trigger an update query using JDBC.

TOUR TO MYSQL

A database is a collection for data to be organized. Software used to manage the database is called **Database Management System**. A database used to manage the relational database is called **Relational Database Management System**. Oracle, MYSQL, Sybase are some of the common RDBMS. MYSQL is a free and open source software used to manipulate the database. It is free, open- source RDBMS. SQL (**Structured Query Language**) is a set of commands that is recognized by **most** of the RDBMs.

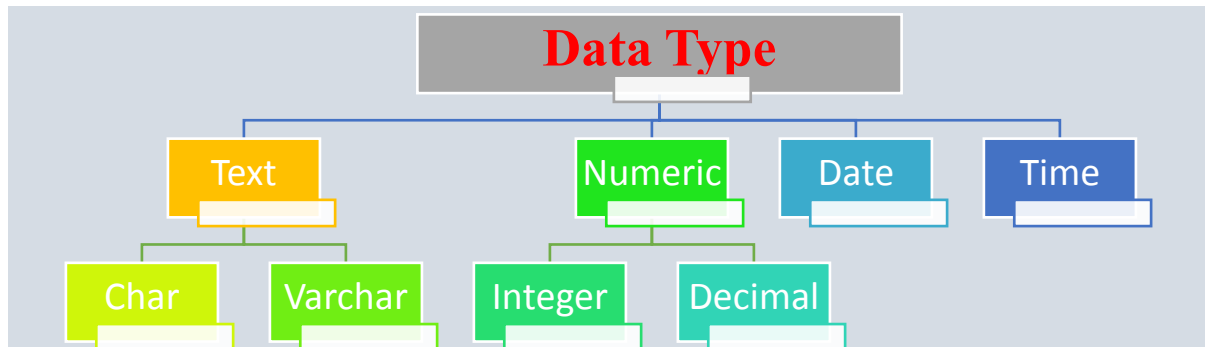
POINTS TO REMEMBER

1. **DDL (Data Definition Language)** This is the first category of SQL command, which can be used to create, destroy or restructure the table in SQL. E.g. CREATE, DROP, ALTER
2. **DML (Data Manipulation Language)** The second category of SQL command is Data Manipulation Language, which can be used to manipulate data in the table. E.g. SELECT, INSERT, UPDATE.
3. **DCL (Data Control Language)** These are the kind of command which can be used to access the database. Eg. GRANT, REVOKE, SAVEPOINT etc.
4. **Meta Data:** Data about data stored in to the table is known as Meta Data.
5. **Data Dictionary:** A file containing facts/data about the data stored in table
6. **Relational Data Model:** In this model data is organized into tables. Related table in to the database are called relations.
7. **Network Data Model** - are represented by collection of records & relationships among data. The collections of records are connected to one another by means of links.
8. **Hierarchical Data Model** - records are organized as trees rather than arbitrary graphs.
9. **Object Oriented Data Model:** Data and associated operations are represented by objects. An object is an identifiable entity with some characteristics and behavior.
10. **Relation:** Table in Database which are interlinked.
11. **Domain:** Pool of values from which the actual values appearing
12. **Tuple:** A record in a table is called Tuple.
13. **Attribute:** A column/Field in a table is known as Attribute.
14. **Degree: (C-D)** Number of attributes/Field/Column in a Table is known as the Degree of the Table.
15. **Cardinality:** Number of tuples/ Record in a table is known as Cardinality of Table.

16. **View:** Virtual table that does not really exist in its own right
17. **Primary Key:** Set of one or more attributes that can uniquely identify tuples within the relation and used to reduce the duplicate record in the table.
18. **Candidate Key:** A Key which is capable of becoming Primary key
19. **Alternate Key:** A candidate key that is not the primary key is known as alternate key.
20. **Foreign Key:** A non-key attribute, whose values are derived from the primary key of some other table.
21. **Integrity Constraints:** Integrity Constraints are the rules that a database must comply with all the times. It determines what all changes are permissible to a database.
22. PRIMARY KEY, UNIQUE, DEFAULT, CHECK, NULL are the key constraints in MYSQL.
23. Entire transaction should be cancelled. If all the operations are executed
24. Successfully, the transaction should be saved to a database.
25. START TRANSACTION statement is used to start a transaction.
26. The process of cancelling a transaction is called Rolling back.
27. ROLLBACK statement is used to terminate a transaction and roll back the
28. Database to its original state before the transaction.
29. COMMIT statement is used to save changes to the database.
30. When AutoCommit is ON, each SQL statement is a transaction. The changes resulting from each statement are automatically committed.
31. **TRANSACTION-**A set of successive statements that succeed or fail as a group so that all effected statements of the group are retained or all are discarded are called transactions. When a transaction is done on the database is called **database transaction**.
32. **COMMIT-**This statement is used to end a transaction and make all changes permanent. Until a transaction is committed, other users cannot see the changes made to the database.
33. **ROLLBACK-** The ROLLBACK statement is used to end a transaction and undo the work done by that transaction. After ROLLBACK, it looks like that transaction had never begun.
34. **SAVEPOINT-**It is point in a transaction, up till which all changes have been saved permanently.
35. **ACID-** It is an acronym of ATOMICITY, CONSISTENCY, ISOLATION, DURABILITY

Data Type

Data Type are used during the creation of table. Data Type tell about the type of value hold by the Attribute/Field in the Table. Data Type used in MYSQL are as



Syntax Used to access MYSQL

1. To Create a New Database

CREATE DATABASE <database Name>;

Create Database Sunny;

2. To Use the Database

USE <database Name>;

Use Student;

3. To Create a New Table.

CREATE TABLE <tablename>

(<column name> <datatype> (<Size>) Key Constraints,.....);

CREATE TABLE Student

(Adm No integer Primary Key, S_name varchar(20),.....);

4. To View the Structure of the Table.

Desc <Table Name>;

Desc Student;

5. To Add New Column in to existing Table.

Alter <Table Name> **Add** <Column Name> <Data Type> <size>;

Alter student add Adm_No Integer;

6. To Modify the existing Column in the table.

Alter <Table Name> **Modify** <Column Name> <Data Type> <size>;

Alter Student Modify S_Name varchar(25);

7. To Drop existing column from the table.

Alter <Table Name> **Drop** <Column Name>;

Alter Student Drop Adm_No;

8. To Add New Record/Tuple/Row in to the existing Table,

Insert into <Table Name>

Values (First Value,'2nd Value'.....n);

Insert into Student

Values (101,'Abhishek Vats','Sunil Kumar');

9. To Show all record of the Table.

Select * from <Table Name>

Select * from student;

STUDENT

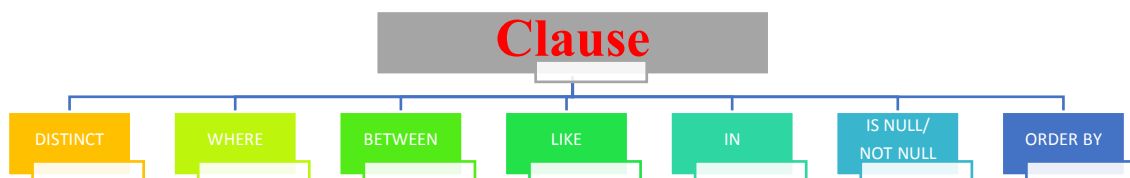
Adm. No	S_Name	F_Name	Class
101	Abhishek	Sunil Kumar	XII
102	Abhimanyu	Arvind Kumar	XI
103	Abhinav	Sunil Kumar	XII
104	Abhishar	Arvind Kumar	X

10. To show the particular column/Attribute Name from the table.

Select Column Name 1, Column Name 2, from <Table Name>

Select S_Name, Adm_No. from Student;

Clause are the kind of condition, can be used with SELECT command to get the tuple on special type of condition.



11. To Eliminate Duplicate Data from the particular row DISTINCT keyword is used.

Select distinct <Column Name> from <Table Name>

SELECT DISTINCT(F_Name) FROM student;

F_Name
Sunil Kumar

Arvind Kumar

12. To show the all column with specified row based on a certain condition.

Select * from Table Name

Where (condition);

Select * from student

Where (Adm_no>=104);

Adm.	S_Name	F_Name	Class
104	Abhishar	Arvind Kumar	X

13. To display the record between certain criteria in MYSQL, BETWEEN clause is used along with WHERE clause.

SELECT * FROM table name

WHERE <column name> BETWEEN <CRITERIA>;

SELECT * FROM student

WHERE adm_no BETWEEN 102 and 105;

14. To display the tuple/Record based on special condition “IN” clause is used.

SELECT * FROM TABLE NAME

WHERE COLUMN NAME IN (KEYWORD);

SELECT * from STUDENT

WHERE S_NAME IN ('KUMAR');

15. During working in MYSQL, if we know only about some value of a specific column and wants to display all those record, then “LIKE” CLAUSE along with “WHERE” clause is used.

SELECT * from table name

WHERE <column name> LIKE '%keyword%';

SELECT * FROM STUDENT

WHERE SNAME LIKE '%SAR%';

NOTE: DISPLAY all the record with “sar” in sname.

SELECT * FROM STUDENT

WHERE SNAME LIKE '%SAR';

NOTE: DISPLAY all the record with sname ending with ‘sar’.

SELECT * FROM STUDENT

WHERE SNAME LIKE 'abhi%;

NOTE: DISPLAY all the record starting with 'abhi' in sname.

SELECT * FROM STUDENT

WHERE SNAME LIKE '____SAR;

NOTE: DISPLAY all the record ending with 'sar' and have 8 character in sname.

SELECT * FROM STUDENT

WHERE SNAME LIKE 'abhi____;

NOTE: DISPLAY all the record starting with 'abhi' and have 8 character in sname.

- 'abhi%' matches any string starting with abhi.
- '%kumar%' matches any string containing 'kumar'
- '%r' matches any string ending with 'r'
- '____' matches any string that is exactly 4 characters long.
- '____%' matches any string that has at least 3 characters.
- '____z' matches any string that is 3 characters long with any 2 characters in the beginning but 'z' as the 4th character.
- The keyword **NOT LIKE** is used to select the rows that do not match the specified pattern.

16. To display all such record which contain 'NULL' value in to the tuple.

SELECT * FROM <TABLE NAME>

WHERE <COLUMN NAME> IS NULL;

17. To display all such record which contain 'NOT NULL' value in to the tuple.

SELECT * FROM <TABLE NAME>

WHERE <COLUMN NAME> IS NULL;

18. To arrange the table data in ascending (ASC) or Descending (DSC) order. By default the order is ascending.

SELECT * FROM <TABLE NAME>

ORDER BY <COLUMN NAME>;

NOTE: Arrange the table data in ascending order by default. If we want to arrange the data in descending order than:

SELECT * FROM <TABLE NAME>

ORDER BY <COLUMN NAME> desc;

19. To update the existing data into the table "UPDATE" command is used.

UPDATE <TABLE NAME> SET <column name>= <column Name> (operator) (value);

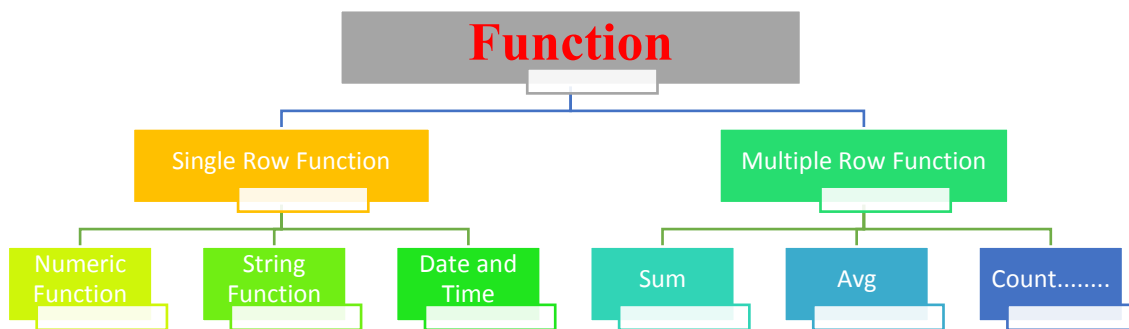
UPDATE SET marks=makrs+5 from student;

20. To delete any tuple/record from the existing table.

DELETE FROM < tablename> [Where < condn>];

DELETE FROM student where (Adm_no =104);

Functions are the most important feature in MYSQL. By using function, we can calculate the sum, avg, min and max values from the table. Function in MYSQL are divided as follow:



NUMERIC FUNTIONS

Pow(X,Y) - Return the Value of X, raised to the power of y.

Select pow(3,3) – Result 27,

Round(X,D) - Round the value of x, upto the decimal place.

Select Round(12.532,1); - Result 13

Round(x) - If number is not defined or it is defined 0 decimal, than it return the nearest integer as result.

Select Round(7.29); - Result 7

Truncate(X,D) - Returns the number X, truncated to D decimal places. If D is 0, the result has no decimal point or fractional part. If D is negative, it causes D digits left of the decimal point of the value X to become zero.

STRING FUNCTIONS

Length(Str) Return the length of a string.

Select Length('Exam Key'); - Result 8

Concat Return the result as Concatenated/ Merged string

SELECT CONCAT('JAWAHAR','NAVODAYA');

Result JAWAHARNAVODAYA

Instr(str,substr)	Return the position of first occurrence in the string of substring in numeric. Select instr('Jawahar', 'har') – Result 5, if the substring not present in the string, than it return 0.
Lower(str)	Return the text in lower case letter.
Or	Select lower('JNV');
Lcase(str)	Result jnv;
Upper (str)	Return the text in upper case letter.
Or	Select upper('jnv');
Ucase(str)	Result JNV;
Left(str,N)	Return the substring starting from left side with number. Select Left('Navodaya',4); - Result Navo;
Right(str,N)	Return the substring starting from Right side with number. Select Right('Navodaya',4); - Result day;
Trim(str)	Remove the space from the string. Select TRIM(' INDIA '); - Result INDIA
Ltrim(str)	Remove the space from the left side of the string. Select LTRIM(' INDIA'); - Result INDIA
Rtrim(str)	Remove the space from the right side of the string. Select RTRIM('INDIA '); - Result INDIA
MID(str,m,n)	Return the substring from the string as per the value of 'M', upto the
Substring(str,m,n)	value of 'N') Select MID('Jawahar',2,4); - Result awah;
ASCII(Str)	Return the ASCII value of first string, return 0, if the string is null.

DATE AND TIME

CURDATE()	Return the current date in the format yyyy-mm-dd. SELECT CURDATE();
NOW()	Return the current date as well as time as yyyy-mm-dd hh:mm:ss; SELECT NOW();
SYSDATE()	Return the current date and time as in NOW(). But the difference between NOW() and SYSDATE() is that SYSDATE() return the time at which time it starts to executes but now return the time at which the statement began to execute.

Date(expression)	Return the date part from date and time part. SELECT DATE('2017-10-19 01:50:42'); – Result 2017-10-19
MONTH(date)	Return the month for which date is passed in numeric form. SELECT MONTH('2017-10-19'); – Result 10
YEAR(date)	Return the year for which the date is passed as expression in numeric form. SELECT YEAR('2017-10-19'); – Result 2017
DAYNAME(date)	Return the day of the date in textual form. SELECT DAYNAME('2017-10-19'); – Result Thursday
DAYOFMONTH(date)	Return the date of the month in numeric form. SELECT DAYNAME('2017-10-19'); – Result 19
DAYOFWEEK(date)	Return the week number of the date in numeric form. SELECT DAYOFWEEK('2017-10-19'); – Result 3
DAYOFYEAR(date)	Return the day of the year in numeric form. SELECT DAYOFYEAR('2017-10-19') – Result 291

MULTIPLE ROW FUNCTIONS

SUM()	Return the sum of a given column/Attribute.
MAX()	Return the maximum value from the given attribute/Column.
MIN()	Return the minimum value from the given attribute/Column.
AVG()	Return the Average value from the given attribute/Column.
COUNT(*)	Count the number of Tuple/Record of a particular Attribute/Column. The syntax count the NULL value also.
COUNT(column)	Count the number of tuple/Record with value and ignore the tuple with null value.

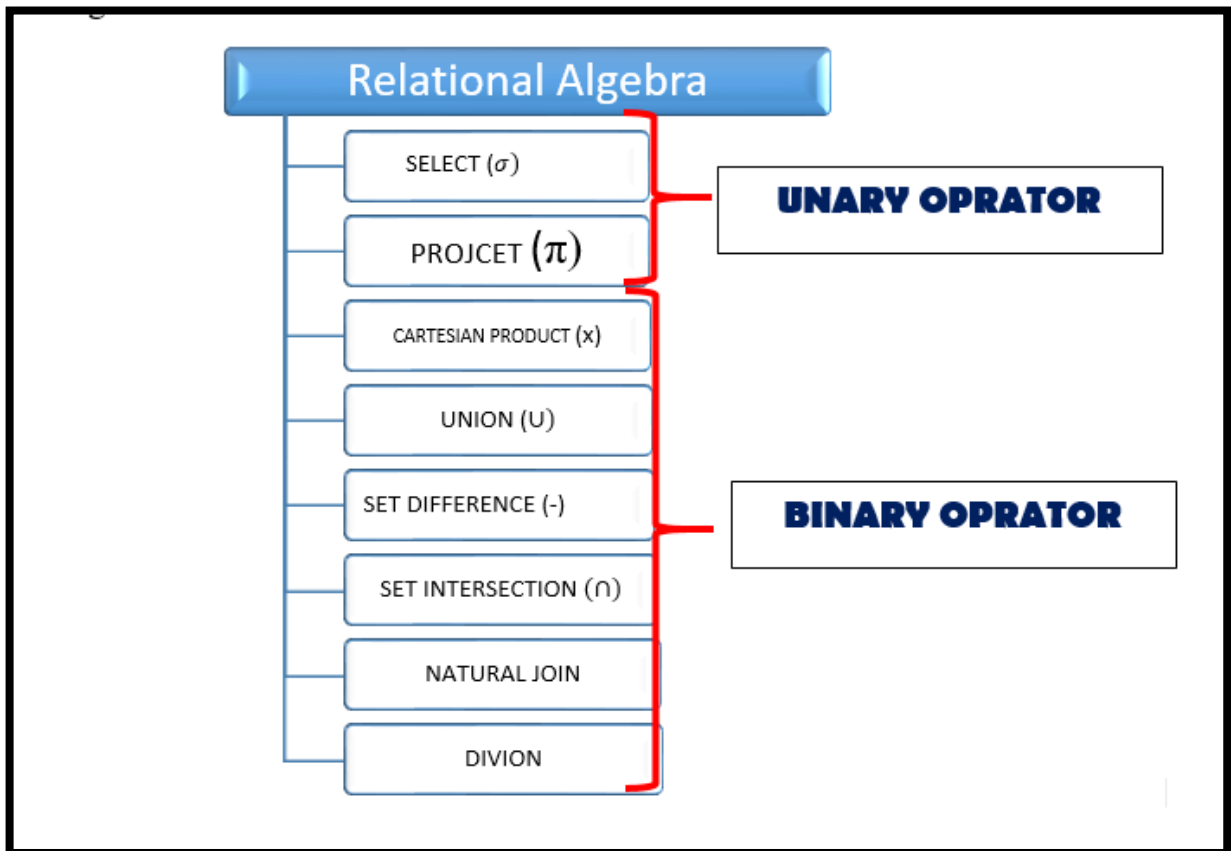
HAVING CLAUSE

HAVING clause place the condition on group or number of rows, on the other hand **WHERE** clause place the condition on single row. Means **WHERE** clause can't be implemented on aggregate functions.

RELATIONAL ALGEBRA

Relational Algebra is a collection of operations on relations. In Each algebraic

operation must have one or more relation as its operands and it produce another relation? Type of Relation Algebra is as follow:

**SELECTION**

Extract tuple from a relation depending on the condition.

PROJECTION

Extract column from a relation.

CARTESIAN PRODUCT

Cartesian Product is the multiplication of Rows in both Relation A and B and Addition of column of Relation A and B.

UNION

Extract the tuple from both the relation A and B which are not common in the relation.

SET INTERSECTION

Extract the tuple, which are common in relation A and B.

SET DIFFERENCE

Extract those tuple, which are present in Relation A, But not present in Relation B

SOLVED QUESTIONS

1. What do you mean by a Database Management System?

Ans- Database Management is a collection of programs and files that allow a user to define structure of a database, store data into it, modify the structure and manipulate the data.

2. What do you mean by Relational database?

Ans-Relational Database is a type of database in which relation is used as its basic element. Row and columns are used to store data.

3. What is a foreign key?

Ans If a key is available in a table as a primary key then this key is called foreign key in another table.

4. What is primary key?

Ans-Primary key is a unique key in a relation which can uniquely identifies a tuple (row) in a given relation.

5. What is SQL?

Ans-SQL is stands for structured query language. This language is used to manipulate data stored in a table.

6. What is referential integrity?

Ans-This is a rule which ensures that in DBMS relationships between records in related tables are valid. And that user don't accidently delete or change related data.

7. What is MySql?

Ans-Mysql is an open source RDBMS which uses SQL.

8. What are DML commands?

Ans- DML commands are used to manipulate data stored in a table. Insertion, deletion and modifications are possible using DML commands.

9. What is DDL?

Ans- DDL provides commands to define or redefine the schema of a table. Table is created, altered and dropped using DDL.

10. Maximum how many characters can be stored in a (i) text literals (ii) numeric literal

Ans-(i) Text literals can have 4000 bytes (ii) A numeric literals can store 53 digits.

11. What is null value in MySql?

Ans-If a column in a row has no value, then column is said to be null.

12. Which keyword eliminates redundant data in from a query result?

Ans- DISTINCT

13. How would you display system date as the result of a query?

Ans- CURDATE()

14. What is NOW() function in MySql?

Ans- It returns the current date and time.

15. What is NOT NULL constraint?

Ans- NOT NULL constraints impose a condition that value of a row cannot be left blank.

16. What is error in following statement?

UPDATE EMPL;

Ans- WHERE clause is missing in given query.

17. Identify the error?

DELETE ALL FROM TABLE EMP;

Ans-There is no need to write ALL and TABLE word in above query. Correct form is-
DELETE FROM EMP;

18. Differentiate WHERE and HAVING clause?

Ans:- Where clause is used to select particular rows that satisfy condition whereas having clause is used in connection with aggregate function, group by clause.

19. How SQL commands are classified?

Ans-SQL Commands are classified into three categories

- (i) Data Definition Language (DDL)-Commands that allow us to perform tasks related to data definition. E.g. creating, altering and dropping
- (ii) Data Manipulation Language (DML) - Commands that allows us to perform data manipulation e.g retrieval, insertion, and modification of data stored in a database.
- (iii) Data Control Language (DCL)-Commands that allow us to manage and control the transactions.

20. What is difference between char and varchar?

Ans-The difference between char and varchar is that of fixed length and variable length. The CHAR data types specifies a fixed length character string. When a column is given data type as CHAR(n) then MySQL ensures that all values stored in that column have this length. But on other hand when a column is given datatype as VARCHAR(n) ,then the maximum size of a value in this column stores exactly what we specify.

21. What do you understand by the terms primary key and degree of a relation in relational data base?

Ans: Primary Key: A primary key is a set of one or more attributes that can uniquely identify tuples within the relations. The number of attributes in a relation is called Degree of a relation in relational data base.

22. What do you understand by the candidate key and cardinality of a relation in relational data base?

Candidate Key: All attribute combinations inside a relation that can serve as primary key(uniquely identifies a row in a relation) are Candidate Keys as they are candidates for the primary key position. The number of rows in a relation is known as cardinality of a relation.

23. Consider the following tables **Item** and **Customer**. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii)

Table: ITEM

S.no	I_ID	Item Name	Manufacturer Price
01	PC01	Personal Computer	ABC 35000
02	LC05	Laptop	ABC 55000
03	PC03	Personal Computer	XYZ 32000
04	PC06	Personal Computer	COMP 37000
05	LC03	Laptop	PQR 57000

Table: CUSTOMER C_ID Customer Name City I_ID

S.no	CUSTOMER C_ID	Customer Name	City	I_ID
01	01	N.Roy	Delhi	LC03
02	06	H.Singh	Mumbai	PC03
03	12	R.Pandey	Delhi	PC06
04	15	C.Sharma	Delhi	LC03
05	16	K.Agrawal	Bangalore	PC01

(i) To display the details of those Customers whose city is Delhi

.Ans: Select all from Customer Where City="Delhi"

(ii) To display the details of Item whose Price is in the range of 35000 to 55000 (Both values included).

Ans: Select all from Item Where Price>=35000 and Price <=55000

(iii) To display the Customer Name, City from table Customer, and Item Name and Price from table Item, with their corresponding matching I_ID.

Ans: Select Customer Name, City, ItemName, Price from Item, Customer
where Item.I_ID=Customer.I_ID.

(iv) To increase the Price of all Items by 1000 in the table Item.

Ans: Update Item set Price=Price+1000

(v) SELECT DISTINCT City FROM Customer.

Ans: City Delhi, Mumbai, Bangalore

(vi) SELECT Item Name, MAX(Price), Count(*) FROM Item GROUP BY Item Name;

Ans: Item Name Max(Price) Count(*) Personal Computer 37000 3 Laptop 57000 2

(vii) SELECT Customer Name, Manufacturer FROM Item, Customer

WHERE Item.Item_Id=Customer.Item_Id;

Ans: Customer Name Manufacturer Name N.Roy PQR

H.Singh XYZ R.Pandey COMP C.Sharma PQR K.Agarwal ABC

(viii) SELECT Item Name, Price * 100 FROM Item WHERE Manufacturer = 'ABC';

Ans: Item Name Price*100 Personal Computer 3500000 Laptop 5500000

UNSOLVED QUESTIONS

1. Write MySql command that will be used to show all the databases which is already created in MySql.
2. The Department column and date of joining of a table Employee is given below:

Department	Date_of_Joining
Biology	2009-07-19
Zoology	2007-02-13
Bio_Tech	2010-05-15
Psychology	2011-09-06

- (i) Based on the above table write SQL Query to display the name of those departments whose name ends with logy?
 - (ii) Based on the above table write SQL Query to display the name of those departments whose name starts with Bi.
3. What is the degree and cardinality of the above given Employee table?
 4. Differentiate between Primary key and Unique Key?
 5. Consider the following tables WORKERS and DESIG. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

WORKERS

W_ID	FIRSTNAME	LASTNAME	ADDRESS CITY
102	Sam	Tones	33 Elm St. Paris
105	Sarah	Ackerman	44 U.S.110 New York
144	Manila	Sengupta	24 Friends Street New Delhi
210	George	Smith	83 First Street Howard
255	Mary	Jones	842 Vine Ave. Losantiville
300	Robert	Samuel	9 Fifth Cross Washington
335	Henry	Williams	12 Moore Street Boston
403	Ronny	Lee	121 Harrison St. Newyork
451	Pat	Thompson	11 Red Road Pari

DESIG

W_ID	SALARY	BENEFITS	DESIGNATION
102	75000	15000	Manager
105	85000	25000	Director
144	70000	15000	Manager
210	75000	12500	Manager
255	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
451	28000	7500	Salesman

(i) To display W_ID First name, address and City of all employees living in New York from the Table Workers

(ii) To display the content of workers table in ascending order of LASTNAME.

(iii) To display the FIRSTNAME, LASTNAME and Total Salary of all Clerks from the tables WORKERS And DESIG, where Total salary is calculated as Salary + benefits.

(iv) To display the minimum salary among managers and Clerks From the tables DESIG.

(v) SELECT FIRSTNAME, SALARY FROM WORKERS, DESIG WHERE DESIGNATION = "MANAGER" AND WORKERS.W_ID = DESIG.W_ID

(vi) SELECT COUNT(DISTINCT DESIGNATION) FROM DESIG ;

(vii) SELECT DESIGNATION, SUM(SALARY) FROM DESIG GROUP BY DESIGNATION HAVING COUNT (*) < 3;

(viii) SELECT SUM(BENEFITS) FROM DESIG WHERE DESIGNATION = "salesman";

POINTS TO REMEMBER

1. e-governance, e-business, and e-learning are the main group of IT applications.
2. e-Governance involves applications which are used by government
3. e-Business applications use technology to effectively access and deliver business related services and perform various kinds of business transactions.
4. Technology to effectively deliver and monitor learning and teaching processes is known as e-learning. They help the trainer to organize and manage his/her lesson plans, present them to students/learners, evaluate and take the feedback to enhance & fine-tune this process in future.
5. An IT application has two major parts: Front-end (User Interface) and back-end (The database, Used for physically storage).
6. The front-end of an IT application is usually a group of one or more forms through which the user enters the input values and is shown the corresponding output. A good front-end ensures the acceptance of the application in the first go.
7. The back-end of an IT application is the database in which all the data is stored. This database resides in the server. All the data which is requested by the front-end is supplied by back-end. A good back-end ensures sustainability, efficiency and easy modification of the application.
8. Development of an IT application involves creation of front-end, back-end, and connecting these two. It also involves testing the application and then implementing it.
9. Use of ICT has its social and economic impacts. Society is impacted as due to ICT people change their way of conducting the transactions and thus save their time, money, and energy. Economy is impacted as ICT leads to fast completion of data transfer and data processing jobs. ICT also brings transparency in the administration.

Short Answer Question

e-Governance involves applications which are used by government agencies/organizations to provide better governance.

e-Business applications use technology to effectively access and deliver business related

services and perform various kinds of business transactions.

e-Learning applications use technology to effectively deliver and monitor learning and teaching processes. They help the trainer to organize and manage his/her lesson plans, present them to students/learners, evaluate and take the feedback to enhance & fine-tune this process in future.

Q 1 Define Front-end and back-end.

Ans : **Front-end:** The front-end of an IT application is usually a group of one or more forms through which the user enters the input values and is shown the corresponding output. A good front-end ensures the acceptance of the application in the first go.

Back-end: The back-end of an IT application is the database in which all the data is stored. This database resides in the server. All the data which is requested by the front-end is supplied by back-end. A good back-end ensures sustainability, efficiency and easy modification of the application.

Q. 2 What are the terms involved in Development of an IT application?

Ans. Development of an IT application involves creation of front-end, back-end, and connecting these two. It also involves testing the application and then implementing it.

Q. 3 Write down the social and economic impacts of ICT?

Ans : Society is impacted as due to ICT people change their way of conducting the transactions and thus save their time, money, and energy. Economy is impacted as ICT leads to fast completion of data transfer and data processing jobs. ICT also brings transparency in the administration.

Q. 4 What do you mean by Infomania?

Ans : Infomania is the condition of reduced concentration caused by continually responding to electronic communications such as e-mail, SMSs, MMSs etc. ICT is making more and more people infomaniac. This is making some people waste their productive time in the office, neglect their families and duties. Some people are also in a habit of frequently checking their e-mails even when they are on vacation with their families. We have to be careful in the use of ICT so that we use it constructively and not get obsessed with it and become infomaniacs.

Q. 5 What OS and fonts are used for Indic Language Support?

Ans : Mac OS 10.5 supports Devanagari, Gujarati, Gurmukhi and Tamil. Linux based desktops support Bengali, Devnagari, Gujarati, Kannada, Malayalam, Oriya, Tamil, Telugu and Gurmukhi,

Q. 6 Write the steps for enabling Indic Language Support in Windows.

Ans Windows 7 and Windows Vista include all the necessary files to support Indic languages Complex(Indic) text support is automatically enabled. Therefore you just need to

enable the keyboard for the language that you want to use by following the steps in the Enable a keyboard layout section. For Windows XP, some additional setup may be required to support Indic languages. Therefore you first follow the steps given under Enabling International Language Support in Windows and then proceed with the steps given under the Enable a keyboard layout section.

Q.7 Write the steps for turning on the language bar.

If you do not see the language bar in the task bar (at the bottom of the desktop) or floating on the desktop, please do the following:

- Step 1: Click **Start**, click **Control Panel**, and then double-click **Regional and Language**
- Step 2: On the **Languages** tab, under **Text Services and input languages**, click **Details**.
- Step 3: Under **Preferences**, click **Language Bar**.
- Step 4: Select the **Show the Language bar on the desktop** check box.

GLOSSARY

10Base2 - Ethernet specification for thin coaxial cable, transmits signals at 10 Mbps (megabits per second) with a distance limit of 185 meters per segment.

10Base5 - Ethernet specification for thick coaxial cable, transmits signals at 10 Mbps (Megabits per second) with a distance limit of 500 meters per segment.

10BaseF - Ethernet specification for fiber optic cable, transmits signals at 10 Mbps (megabits per second) with a distance limit of 2000 meters per segment.

10BaseT - Ethernet specification for unshielded twisted pair cable (category 3, 4, or 5), transmits signals at 10 Mbps (megabits per second) with a distance limit of 100 meters per segment.

100BaseT - Ethernet specification for unshielded twisted pair cabling that is used to transmit data at 100 Mbps (megabits per second) with a distance limit of 100 meters per segment.

1000BaseTX -Ethernet specification for unshielded twisted pair cabling that is used to transmit data at 1 Gbps (gigabits per second) with a distance limitation of 220 meters per segment.

Algorithm - A finite set of step-by-step instructions for a problem-solving or computation procedure, especially one that can be implemented by a computer.

AppleTalk - Apple Computer's network protocol originally designed to run over LocalTalk networks, but can also run on Ethernet and Token Ring. **Applet** -Java programs, an application program that uses the clients web browser to provide a user interface.

ARPANET - Advanced Research Projects Agency Network, a pioneer packet switched network that was built in the early 1970s under contract to the US Government, led to the development of today's Internet, and was decommissioned in June 1990.

Asynchronous Transfer Mode (ATM) - A network protocol that transmits data at a speed of 155 Mbps and higher. It is most often used to interconnect two or more local area networks.

AUI Connector (Attachment Unit Interface) - A 15 pin connector found on Ethernet cards that can be used for attaching coaxial, fiber optic, or twisted pair cable. **Access Control** - Access Control ensures that resources are only granted to those users who are entitled to them.

Authentication - Authentication is the process of confirming the correctness of the claimed identity.

Authenticity - Authenticity is the validity and conformance of the original information.

Authorization - Authorization is the approval, permission, or empowerment for someone or something to do something.

Availability - Availability is the need to ensure that the business purpose of the system can be met and that it is accessible to those who need to use it.

Backbone - A cable to which multiple nodes or workstations are attached.

Bandwidth - Commonly used to mean the capacity of a communication channel to pass data through the channel in a given amount of time. Usually expressed in bits per second.

Banner - A banner is the information that is displayed to a remote user trying to connect to a service. This may include version information, system information, or a warning about authorized use.

Basic Authentication - Basic Authentication is the simplest web-based authentication scheme that works by sending the username and password with each request.

BIND - BIND stands for Berkeley Internet Name Domain and is an implementation of DNS. DNS is used for domain name to IP address resolution.

Biometrics - Biometrics use physical characteristics of the users to determine access.

Bit - The smallest unit of information storage; a contraction of the term "binary digit;" one of two symbols "0" (zero) and "1" (one) - that are used to represent binary numbers.

BNC Connector - Standard connector used to connect 10Base2 coaxial cable.

Boot Record Infector - A boot record infector is a piece of malware that inserts malicious code into the boot sector of a disk.

Bridge - Devices that connect and pass packets between two network segments that use the same communications protocol.

Broadcast - To simultaneously send the same message to multiple recipients. One host to all hosts on network.

Broadcast Address - An address used to broadcast a datagram to all hosts on a given network using UDP or ICMP protocol.

Browser - A client computer program that can retrieve and display information from servers on the World Wide Web.

Byte - A fundamental unit of computer storage. Usually holds eight bits.

Cable - Transmission medium of copper wire or optical fiber wrapped in a protective cover.

Cache - Pronounced cash, a special high speed storage mechanism. It can be either a

reserved section of main memory or an independent high-speed storage device.

Two types of caching are commonly used in personal computers. Memory caching and disk caching.

Cell - A cell is a unit of data transmitted over an ATM network.

Ciphertext - Ciphertext is the encrypted form of the message being sent.

Client - A system entity that requests and uses a service provided by another system entity, called a "server." In some cases, the server may itself be a client of some other server.

Coaxial Cable - Cable consisting of a single copper conductor in the center surrounded by a plastic layer for insulation and a braided metal outer shield.

Collision - A collision occurs when multiple systems transmit simultaneously on the same wire.

Computer Network - A collection of host computers together with the sub-network or inter-network through which they can exchange data.

Concentrator - A device that provides a central connection point for cables from workstations, servers, and peripherals.

Most concentrators contain the ability to amplify the electrical signal they receive.

Cron - Cron is a Unix application that runs jobs for users and administrators at scheduled times of the day.

Crossover Cable - A crossover cable reverses the pairs of cables at the other end and can be used to connect devices directly together.

CSMA/CA - Carrier Sense Multiple Access Collision Avoidance is a network access method in which each device signals its intent to transmit before it actually does so. This prevents other devices from sending information, thus preventing collisions from occurring between signals from two or more devices.

CSMA/CD - Carrier Sense Multiple Access Collision Detection is a network access method in which devices that are ready to transmit data first check the channel for a carrier. If no carrier is sensed, a device can transmit. If two devices transmit at once, a collision occurs and each computer backs off and waits a random amount of time before attempting to retransmit. This is the access method used by Ethernet.

Cut-Through - Cut-Through is a method of switching where only the header of a packet is read before it is forwarded to its destination.

Cyclic Redundancy Check (CRC) - Sometimes called "cyclic redundancy code." A type of checksum algorithm that is not a cryptographic hash but is used to implement data integrity service where accidental changes to data are expected.

Data Encryption Standard (DES) – A widely-used method of data encryption using a private (secret) key. There are 72,000,000,000,000,000 (72 quadrillion) or more possible encryption keys that can be used. For each given message, the key is chosen at random from among this enormous number of keys. Like other private key cryptographic methods, both the sender and the receiver must know and use the same private key.

Data Mining - Data Mining is a technique used to analyze existing information, usually with the intention of pursuing new avenues to pursue business.

Data Owner - A Data Owner is the entity having responsibility and authority for the data.

Data Warehousing - Data Warehousing is the consolidation of several previously independent databases into one location.

Decryption - Decryption is the process of transforming an encrypted message into its original plaintext.

Denial of Service - The prevention of authorized access to a system resource or the delaying of system operations and functions.

Digital Envelope - A digital envelope is an encrypted message with the encrypted session key.

Digital Signature - A digital signature is a hash of a message that uniquely identifies

the sender of the message and proves the message that changed since transmission.

DIN - A plug and socket connector consisting of a circular pattern of pins in a metal sleeve. This type of connector is commonly seen on keyboards.

Distance Vector - Distance vectors measure the cost of routes to determine the best route to all known networks.

Distributed Scans - Distributed Scans are scans that use multiple source addresses to gather information.

Domain - On the Internet, a domain consists of a set of network addresses. In Windows NT and Windows 2000, a domain is a set of network resources

Domain Name - A domain name locates an organization or other entity on the Internet..

Domain Name System (DNS) – The domain name system (DNS) is the way that Internet domain names are located and translated into Internet Protocol addresses. A domain name is a meaningful and easy-to-remember for an Internet address.

Dumb Terminal - Refers to devices that are designed to communicate exclusively with a host (main frame) computer. It receives all screen layouts from the host computer and sends all keyboard entry to the host. It cannot function without the host computer.

Dynamic Link Library - A collection of small programs, any of which can be called

when needed by a larger program that is running in the computer.

E-mail - An electronic mail message sent from a host computer to a remote computer.

Eavesdropping - Eavesdropping is simply listening to a private conversation which may reveal information which can provide access to a facility or network.

End User - Refers to the human executing applications on the workstation.

Ethernet - A network protocol invented by Xerox Corporation and developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks use CSMA/CD and run over a variety of cable types at 10 Mbps (megabits per second).

Expansion Slot - Area in a computer that accepts additional input/output boards to increase the capability of the computer.

Event - An event is an observable occurrence in a system or network.

Fast Ethernet - An Ethernet standard that supports 100 Mbps using category 5 twisted pair or fiber optic cable.

Fiber Distributed Data Interface (FDDI) - A network protocol that is used primarily to interconnect two or more local area networks, often over large distances.

Fiber Optic Cable - A cable, consisting of a center glass core surrounded by layers of plastic, that transmits data using light rather than electricity. It has the ability to carry

more information over much longer distances.

File Server - A computer connected to the network that contains primary files/applications and shares them as requested with the other computers on the network. If the file server is dedicated for that purpose only, it is connected to a client/server network. An example of a legacy client/server network is Novell Netware. All the computers connected to a peer-to-peer network are capable of being the file server. Most modern operating systems can operate as servers or as clients, greying the distinction in the server architecture.

File Transfer Protocol (FTP) - A TCP/IP protocol specifying the transfer of text or binary files across the network.

Filter - A filter is used to specify which packets will or will not be used. It can be used in sniffers to determine which packets get displayed, or by firewalls to determine which packets get blocked.

Firewall - A security device which inspects traffic entering and leaving a network, and allows or disallows the traffic, depending on rules describing acceptable use of the network, by filtering out unwanted packets. The firewall is usually positioned as the gateway device to another network, such as the internet. Many routers now contain firewalls. A personal firewall is usually

software that runs on a workstation or server to filter unwanted traffic at the individual machine.

Fragmentation - The process of storing a data file in several "chunks" or fragments rather than in a single contiguous sequence of bits in one place on the storage medium.

Frames - Data that is transmitted between network points as a unit complete with addressing and necessary protocol control information. A frame is usually transmitted serial bit by bit and contains a header field and a trailer field that "frame" the data.

Full Duplex - A type of duplex communications channel which carries data in both directions at once. Communications in which both sender and receiver can send at the same time.

Fully-Qualified Domain Name - A Fully-Qualified Domain Name is a server name with a hostname followed by the full domain name.

Gateway - A network point that acts as an entrance to another network.

Gigabit Ethernet - An Ethernet protocol that raises the transmission rates to 1 Gbps (gigabits per second). Most school, corporate, and household networks provide gigabit ethernet to the workstations via cabled connections.

Gigabyte (GB) - One billion bytes of information. One thousand megabytes.

GNU - GNU is a Unix-like operating system that comes with source code that can be copied, modified, and redistributed. The GNU project was started in 1983 by Richard Stallman and others, who formed the Free Software Foundation.

Gnutella - An Internet file sharing utility. Gnutella acts as a server for sharing files while simultaneously acting as a client that searches for and downloads files from other users.

Header - A header is the extra information in a packet that is needed for the protocol stack to process the packet.

Host - Any computer that has full two-way access to other computers on the Internet. Or a computer with a web server that serves the pages for one or more Web sites.

HTTP Proxy - An HTTP Proxy is a server that acts as a middleman in the communication between HTTP clients and servers.

Hub - A hub is a network device that operates by repeating data that it receives on one port to all the other ports. As a result, data transmitted by one host is retransmitted to all other hosts on the hub.

Hyperlink - In hypertext or hypermedia, an information object that points to related information that is located elsewhere and can be retrieved by activating the link.

Hypertext Markup Language (HTML) - The set of markup symbols or codes

inserted in a file intended for display on a World Wide Web browser page.

Hypertext Transfer Protocol (HTTP) -

The protocol in the Internet Protocol (IP) family used to transport hypertext documents across an internet.

Hub - A hardware device that contains multiple independent but connected modules of network and internetwork equipment. Hubs can be active (where they repeat signals sent through them) or passive (where they do not repeat but merely split signals sent through them).

Infrared - Electromagnetic waves whose frequency range is above that of microwaves, but below that of the visible spectrum.

Integrity - Integrity is the need to ensure that information has not been changed accidentally or deliberately, and that it is accurate and complete.

Internet - A term to describe connecting multiple separate networks together.

Internet Message Access Protocol

(IMAP) - A protocol that defines how a client should fetch mail from and return mail to a mail server. IMAP is intended as a replacement for or extension to the Post Office Protocol.

Internet Protocol (IP) - The method or protocol by which data is sent from one computer to another on the Internet.

Intranet - A computer network, especially

based on Internet technology that an organization uses for its own internal, and usually private, purposes and that is closed to outsiders.

Intrusion Detection - A security management system for computers and networks. An IDS gathers and analyzes information from various areas within a computer or a network to identify possible security breaches, which include both intrusions (attacks from outside the organization) and misuse (attacks from within the organization).

IP Address - A computer inter-network address that is assigned for use by the Internet Protocol and other protocols. An IP version 4 address is written as a series of four 8-bit numbers separated by periods.

IP Spoofing - The technique of supplying a false IP address.

ISO - International Organization for Standardization, a voluntary, non-treaty, non-government organization, established in 1947, with voting members that are designated standards bodies of participating nations and non-voting observer organizations.

Kernel - The essential center of a computer operating system, the core that provides basic services for all other parts of the operating system. A synonym is nucleus. A kernel can be contrasted with a shell, the outermost part of an operating system that

interacts with user commands. Kernel and shell are terms used more frequently in Unix and some other operating systems than in IBM mainframe systems.

LAN (Local Area Network) - A network connecting computers in a relatively small area such as a building.

Linear Bus - A network topology in which each node attaches directly to a common cable.

LocalTalk - Apple Corporation proprietary protocol that uses CSMA/CA media access scheme and supports transmissions at speeds of 230 Kbps (Kilobits per second).

Logic Gate - A logic gate is an elementary building block of a digital circuit. Most logic gates have two inputs and one output. As digital circuits can only understand binary, inputs and outputs can assume only one of two states, 0 or 1.

MAN (Metropolitan Area Network) – A network connecting computers over a large geographical area, such as a city or school district.

MAU (Multistation Access Unit) – A Token Ring wiring hub.

Modem (Modulator/Demodulator) - Devices that convert digital and analog signals. Modems allow computer data (digital) to be transmitted over voice-grade telephone lines (analog).

Multiplexer - A device that allows multiple logical signals to be transmitted

simultaneously across a single physical channel.

MAC Address - A physical address, a numeric value that uniquely identifies that network device from every other device on the planet.

Malicious Code - Software (e.g., Trojan horse) that appears to perform a useful or desirable function, but actually gains unauthorized access to system resources or tricks a user into executing other malicious logic.

Malware - A generic term for a number of different types of malicious code.

Multiplexing - To combine multiple signals from possibly disparate sources, in order to transmit them over a single path.

Network Modem - A modem connected to a Local Area Network (LAN) that is accessible from any workstation on the network.

Network Interface Card (NIC) - A board that provides network communication capabilities to and from a computer.

Network Mapping - To compile an electronic inventory of the systems and the services on your network.

Network Operating System (NOS) - Operating system designed to pass information and communicate between more than one computers. Examples include Linux/Unix and Windows Server.

Node - End point of a network connection.

Nodes include any device attached to a network such as file servers, printers, or workstations.

Node Devices - Any computer or peripheral that is connected to the network.

Octet - A sequence of eight bits. An octet is an eight-bit byte.

Packet - A piece of a message transmitted over a packet-switching network. One of the key features of a packet is that it contains the destination address in addition to the data. In IP networks, packets are often called datagrams.

Packet Switched Network - A packet switched network is where individual packets each follow their own paths through the network from one endpoint to another.

Partitions - Major divisions of the total physical hard disk space.

Password Authentication Protocol

(PAP) - Password Authentication Protocol is a simple, weak authentication mechanism where a user enters the password and it is then sent across the network, usually in the clear.

Password Cracking - Password cracking is the process of attempting to guess passwords, given the password file information.

Password Sniffing - Passive wiretapping, usually on a local area network, to gain knowledge of passwords.

Patch - A patch is a small update released by a software manufacturer to fix bugs in existing programs.

Patching - Patching is the process of updating software to a different version.

PCMCIA - (later versions were

PCMCIA2 and **PC Card**) An expansion slot found in many laptop computers.

Largely replaced by USB in the 2000-2010 period.

Peer-to-Peer Network - A network in which resources and files are shared without a centralized management source.

Penetration Testing - Penetration testing is used to test the external perimeter security of a network or facility.

Personal Firewalls - Personal firewalls are those firewalls that are installed and run on individual PCs.

Phishing - The use of e-mails that appear to originate from a trusted source to trick a user into entering valid credentials at a fake website. Typically the e-mail and the web site looks like they are part of a bank the user is doing business with.

Physical Topology - The physical layout of the network; how the cables are arranged; and how the computers are connected.

Plaintext - Ordinary readable text before being encrypted into ciphertext or after being decrypted.

Point-to-Point - A direct link between two objects in a network.

Point-to-Point Protocol (PPP) – A protocol for communication between two computers using a serial interface, typically a personal computer connected by phone line to a server. It packages your computer TCP/IP packets and forwards them to the server where they can actually be put on the Internet.

Point-to-Point Tunneling Protocol (PPTP) - A protocol (set of communication rules) that allows corporations to extend their own corporate network through private "tunnels" over the public Internet.

Polymorphism - Polymorphism is the process by which malicious software changes its underlying code to avoid detection.

Ports - A connection point for a cable.

Possession - Possession is the holding, control, and ability to use information.

Post Office Protocol, Version 3 (POP3) - An Internet Standard protocol by which a client workstation can dynamically access a mailbox on a server host to retrieve mail messages that the server has received and is holding for the client.

Proprietary Information – Proprietary information is that information unique to a company and its ability to compete, such as customer lists, technical data, product costs, and trade secrets.

Protocol -A formal description of a set of rules and conventions that govern how

devices on a network exchange information.

Protocol Stacks (OSI) - A set of network protocol layers that work together.

Proxy Server - A server that acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service. A proxy server is associated with or part of a gateway server that separates the enterprise network from the outside network and a firewall server that protects the enterprise network from outside intrusion.

Public Key - The publicly-disclosed component of a pair of cryptographic keys used for asymmetric cryptography.

RAID (Redundant Array of Inexpensive Disks) - A configuration of multiple disks designed to preserve data after a disk casualty.

RAM (Random Access Memory) – The working memory of a computer where data and programs are temporarily stored. RAM only holds information when the computer is on.

Registry - he Registry in Windows operating systems is the central set of settings and information required to run the Windows computer.

Regression analysis - The use of scripted tests which are used to test software for all possible input is should expect. Typically

developers will create a set of regression tests that are executed before a new version of a software is released.

Repeater - A device used in a network to strengthen a signal as it is passed along the network cable

Request for Comment (RFC) - A series of notes about the Internet, started in 1969 (when the Internet was the ARPANET).

An Internet Document can be submitted to the IETF by anyone, but the IETF decides if the document becomes an RFC. Eventually, if it gains enough interest, it may evolve into an Internet standard.

RJ-45 - Standard connectors used for unshielded twisted-pair cable.

Root - Root is the name of the administrator account in Unix systems.

Rootkit - A collection of tools (programs) that a hacker uses to mask intrusion and obtain administrator-level access to a computer or computer network.

Router - Routers interconnect logical networks by forwarding information to other networks based upon IP addresses.

SCSI (Small Computer Serial Interface) - An interface controller that allows several peripherals to be connected to the same port on a computer.

Segment - Refers to a section of cable on a network. In Ethernet networks, two types of segments are defined. A populated or trunk segment is a network cable that has one or

more nodes attached to it. A link segment is a cable that connects a computer to an interconnecting device, such as a repeater or concentrator, or connects a interconnecting device to another interconnecting device.

Security Policy - A set of rules and practices that specify or regulate how a system or organization provides security services to protect sensitive and critical system resources.

Segment - Segment is another name for TCP packets.

Server-A system entity that provides a service in response to requests from other system entities called clients.

Session - A session is a virtual connection between two hosts by which network traffic is passed.

Shell - A Unix term for the interactive user interface with an operating system. The shell is the layer of programming that understands and executes the commands a user enters. In some systems, the shell is called a command interpreter. A shell usually implies an interface with a command syntax (think of the DOS operating system and its "C:>" prompts and user commands such as "dir" and "edit").

Signature - A Signature is a distinct pattern in network traffic that can be identified to a specific tool or exploit.

Sneaker-Net - Refers to a manual method of sharing files in which a file is copied from a computer to a floppy disk, transported to a second computer by a person physically walking (apparently wearing sneakers) to the second computer, and manually transferring the file from floppy disk to the second computer.

Socket - The socket tells a host's IP stack where to plug in a data stream so that it connects to the right application.

Software - Computer programs (which are stored in and executed by computer hardware) and associated data (which also is stored in the hardware) that may be dynamically written or modified during execution.

Source Port - The port that a host uses to connect to a server. It is usually a number greater than or equal to 1024. It is randomly generated and is different each time a connection is made.

Spam - Electronic junk mail or junk newsgroup postings.

Speed of Data Transfer - The rate at which information travels through a network, usually measured in megabits per second.

Spoof - Attempt by an unauthorized entity to gain access to a system by posing as an authorized user.

Star Topology - LAN topology in which each node on a network is connected

directly to a central network hub or concentrator.

Star-Wired Ring - Network topology that connects network devices (such as computers and printers) in a complete circle.

Sub Network - A separately identifiable part of a larger network that typically represents a certain limited number of host computers, the hosts in a building or geographic area, or the hosts on an individual local area network.

Subnet Mask - A subnet mask (or number) is used to determine the number of bits used for the subnet and host portions of the address. The mask is a 32-bit value that uses one-bits for the network and subnet portions and zero-bits for the host portion.

Switch - A switch is a networking device that keeps track of MAC addresses attached to each of its ports so that data is only transmitted on the ports that are the intended recipient of the data.

Switched Network - A communications network, such as the public switched telephone network, in which any user may be connected to any other user through the use of message, circuit, or packet switching and control devices. Any network providing switched communications service.

Synchronization - Synchronization is the

signal made up of a distinctive pattern of bits that network hardware looks for to signal that start of a frame.

Syslog - Syslog is the system logging facility for Unix systems.

System Security Officer (SSO) – A person responsible for enforcement or administration of the security policy that applies to the system.

System-Specific Policy - A System specific policy is a policy written for a specific system or device

Switch – A "intelligent" type of hub, in that it sends packets only to the intended ports, rather than all computers on the network.

T1, T3 - A digital circuit using TDM (Time-Division Multiplexing).

Tamper - To deliberately alter a system's logic, data, or control information to cause the system to perform unauthorized functions or services.

Tape Back-Up - A common server or network peripheral which allows copying data and programs from a computer system to magnetic tape. On tape, data is stored sequentially. When retrieving data, the tape is searched from the beginning of tape until the data is found.

TCP Full Open Scan - TCP Full Open scans check each port by performing a full three-way handshake on each port to determine if it was open.

TCP Half Open Scan - TCP Half Open scans work by performing the first half of a three-way handshake to determine if a port is open.

TCP Wrapper - A software package which can be used to restrict access to certain network services based on the source of the connection; a simple tool to monitor and control incoming network traffic.

TCP/IP - A synonym for "Internet Protocol Suite;" in which the Transmission Control Protocol and the Internet Protocol are important parts. TCP/IP is the basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an Intranet or an Extranet).

TELNET - A TCP-based, application layer, Internet Standard protocol for remote login from one host to another.

Terminator - A device that provides electrical resistance at the end of a transmission line. Its function is to absorb signals on the line, thereby keeping them from bouncing back and being received again by the network.

Threat - A potential for violation of security, which exists when there is a circumstance, capability, action, or event that could breach security and cause harm.

Thicknet - A thick coaxial cable that is used with a 10Base5 Ethernet LAN.

Thinnet - A thin coaxial cable that is used with a 10Base2 Ethernet LAN.

Token - A special packet that contains data and acts as a messenger or carrier between each computer and device on a ring topology. Each computer must wait for the messenger to stop at its node before it can send data over the network.

Token Ring - A network protocol developed by IBM in which computers access the network through token-passing. Usually uses a star wired ring topology.

Topology - There are two types of topology: physical and logical. The physical topology of a network refers to the configuration of cables, computers, and other peripherals. Logical topology is the method used to pass the information between workstations. Issues involving logical topologies are discussed on the Protocol chapter

Transceiver (Transmitter/Receiver) - A Device that receives and sends signals over a medium. In networks, it is generally used to allow for the connection between two different types of cable connectors, such as AUI and RJ-45.

Transmission Control Protocol (TCP) - A set of rules (protocol) used along with the Internet Protocol to send data in the form of message units between computers over the Internet. While IP takes care of handling the actual delivery of the data, TCP takes care

of keeping track of the individual units of data (called packets) that a message is divided into for efficient routing through the Internet. Whereas the IP protocol deals only with packets, TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.

Transport Layer Security (TLS) – A protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message. TLS is the successor to the Secure Sockets Layer.

Tree Topology - LAN topology similar to linear bus topology, except that tree networks can contain branches with multiple nodes.

Trojan Horse - A computer program that appears to have a useful function, but also has a hidden and potentially malicious function that evades security mechanisms, sometimes by exploiting legitimate authorizations of a system entity that invokes the program.

Trunking - Trunking is connecting switched together so that they can share VLAN information between them.

Trust - Trust determine which permissions and what actions other systems or users can perform on remote machines.

Tunnel - A communication channel created in a computer network by encapsulating a communication protocol's data packets in (on top of) a second protocol that normally would be carried above, or at the same layer as, the first one. Most often, a tunnel is a logical point-to point link

Twisted Pair - Network cabling that consists of four pairs of wires that are manufactured with the wires twisted to certain specifications. Available in shielded and unshielded versions.

UDP Scan - UDP scans perform scans to determine which UDP ports are open.

Unicast - Broadcasting from host to host.

Uniform Resource Identifier (URI) – The generic term for all types of names and addresses that refer to objects on the World Wide Web.

Uniform Resource Locator (URL) – The global address of documents and other resources on the World Wide Web. The first part of the address indicates what protocol to use, and the second part specifies the IP address or the domain name where the resource is located. For example, <http://www.pcwebopedia.com/index.html>.

Unix - A popular multi-user, multitasking operating system developed at Bell Labs in the early 1970s. Created by just a handful

of programmers, Unix was designed to be a small, flexible system used exclusively by programmers.

USB/ USB2 Port - A hardware interface for peripherals from keyboards to hard drives, widely used on all computers.

User Datagram Protocol (UDP) – A communications protocol that, like TCP, runs on top of IP networks. Unlike TCP/IP, UDP/IP provides very few error recovery services, offering instead a direct way to send and receive datagrams over an IP network.

Virtual Private Network (VPN) – A restricted-use, logical computer network that is constructed from the system resources of a relatively public, physical network, often by using encryption and often by tunneling links of the virtual network across the real network.

Virus - Vital Information Resources Under Seize. A hidden, self-replicating section of computer software, usually malicious logic, that propagates by infecting

WAN (Wide Area Network) - A network connecting computers within very large areas, such as states, countries, and the world.

Web Server - A software process that runs on a host computer connected to the Internet to respond to HTTP requests for documents from client web browsers.

WHOIS - An IP for finding information about resources on networks.

Windump - Windump is a freeware tool for Windows that is a protocol analyzer that can monitor network traffic on a wire.

World Wide Web ("the Web", WWW, W3) - The global, hypermedia-based collection of information and services that is available on Internet servers and is accessed by browsers using Hypertext Transfer Protocol and other information retrieval mechanisms.

Worm - A computer program that can run independently, can propagate a complete working version of itself onto other hosts on a network, and may consume computer resources destructively.

Workstation - A computer connected to a network at which users interact with software stored on the network.

Workgroup - A collection of workstations and servers on a LAN that are designated to communicate and exchange data with one another.

Zombies - A zombie computer (often shortened as zombie) is a computer connected to the Internet that has been compromised by a hacker, a computer virus, or a Trojan horse. Generally, a compromised machine is only one of many in a botnet, and will be used to perform malicious tasks of one sort or another under remote direction. Most owners of zombie

computers are unaware that their system is being used in this way. Because the owner tends to be unaware, these computers are metaphorically compared to zombies.

JAVA TERM

100% Pure Java - A Sun Microsystems initiative to guide developers in writing, certifying, and marketing applications written entirely in the Java programming language.

AWT (Abstract Window Toolkit)

A collection of GUI components that were implemented using native-platform versions of the components.

ABSTRACT

A Java programming language keyword used in a class definition to specify that a class is not to be instantiated, but rather inherited by other classes. An abstract class can have abstract methods that are not implemented in the abstract class, but in subclasses.

Abstract Class - A class that contains one or more *abstract methods*, and therefore can never be instantiated. Abstract classes are defined so that

other classes can extend them and make them concrete by implementing the abstract methods.

Access Control - The methods by which interactions with resources are limited to collections of users or programs for the purpose of enforcing integrity, confidentiality, or availability constraints.

ACID - The acronym for the four properties guaranteed by transactions: Atomicity, Consistency, Isolation, and Durability.

Actual Parameter list - The arguments specified in a particular method call.

API- Application Programming Interface. The specification of how a programmer writing an application accesses the behavior and state of classes and objects.

APPLET -A component that typically executes in a Web browser, but can execute in a variety of other applications or devices that support the applet programming model.

APPLET CONTAINER - A container that includes support for the applet programming model.

ARRAY- A collection of data items, all of the same type, in which each item's position is uniquely designated by an integer.

ASCII - American Standard Code for Information Interchange. A standard assignment of 7-bit numeric codes to characters.

AUTHENTICATION-The process by which an entity proves to another entity that it is acting on behalf of a specific identity.

AUTHORIZATION CONSTRAINT - A set of security roles that are allowed access to the resources in a Web resource collection.

BEAN - A reusable software component. Beans can be combined to create an application. *Bean-managed persistence* when the transfer of data between an entity bean instance's variables and the underlying resource manager is managed by the entity bean.

Binary Operator - An operator that has two arguments.

Bit - The smallest unit of information in a computer, with a value of either 0 or 1.

Bitwise Operator - An operator that manipulates the bits of one or more of its operands individually and in parallel.

Block - In the Java programming language, any code between matching braces. Example: { x = 1; }.

Boolean - Refers to an expression or variable that can have only a true or false value. The Java programming language provides the boolean type and the literal values true and false.

Break - Java programming language keyword used to resume program execution at the statement immediately following the current statement. If followed by a label, the program resumes execution at the labeled statement.

BYTE - A sequence of eight bits. The Java programming language provides a corresponding byte type.

BYTECODE - Machine-independent code generated by the Java compiler and executed by the Java interpreter.

CASE - A Java programming language keyword that defines a group of statements to begin executing if a value specified matches the value defined by a preceding "switch" keyword.

Casting - Explicit conversion from one data type to another.

CATCH - A Java programming language keyword used to declare a block of statements to be executed in the event that a Java exception, or run time error, occurs in a preceding "try" block.

CHAR - A Java programming language keyword used to declare a variable of type character.

CLASS - In the Java programming language, a type that defines the implementation of a particular kind of object. A class definition defines instance and class variables and methods, as well as specifying the interfaces the class implements and the immediate superclass of the class. If the superclass is not explicitly specified, the superclass will implicitly be Object.

Class Method - A method that is invoked without reference to a particular object. Class methods affect the class as a whole, not a particular instance of the class.

Class Variable - A data item associated with a particular class as a whole--not with particular instances of the class. Class variables are defined in class definitions.

Comment - In a program, explanatory text that is ignored by the compiler. In programs written in the Java programming language, comments are delimited using // or /*...*/.

Commit - The point in a transaction when all updates to any resources involved in the transaction are made permanent.

COMPILOR - A program to translate source code into code to be executed by a computer. The Java compiler translates source code written in the Java programming language into bytecode for the

CONSTRUCTOR - A pseudo-method that creates an object. In the Java programming language,

constructors are instance methods with the same name as their class. Constructors are invoked using the new keyword.

CONST - This is a reserved Java programming language keyword. However, it is not used by current versions of the Java programming language.

CONTAINER - An entity that provides life cycle management, security, deployment, and runtime services to components.

DEFAULT - A Java programming language keyword optionally used after all "case" conditions in a "switch" statement. If all "case" conditions are not matched by the value of the "switch" variable, the "default" keyword will be executed.

Definition - A declaration that reserves storage (for data) or provides implementation

Double - A Java programming language keyword used to define a variable of type double.

DTD - Document Type Definition. A description of the structure and properties of a class of XML files.

Else - A Java programming language keyword used to execute a block of statements in the case that the test condition with the "if" keyword evaluates to false.

Encapsulation – Wrapping up of data in to a single unit.

GUI - Graphical User Interface. Refers to the techniques involved in using graphics, along with a keyboard and a mouse, to provide an easy-to-use interface to some program.

HTML - HyperText Markup Language. This is a file format, based on SGML, for hypertext documents on the Internet. It is very simple and allows for the embedding multimedia. References to other objects are embedded using URLs.

HTTP - HyperText Transfer Protocol. The Internet protocol, based on TCP/IP, used to fetch hypertext objects from remote hosts.

JAVASCRIPT - A Web scripting language that is used in both browsers and Web servers. Like all scripting languages, it is used

primarily to tie other components together or to accept user input.

JDBC - Java Database Connectivity. An industry standard for database-independent connectivity between the Java platform and a wide range of databases. The JDBC interface provides a call-level

JDK - Java Development Kit software. A software development environment for writing applets and application in the Java programming language.

JPEG - Joint Photographic Experts Group. An image file compression standard established by this group.

JIT - *Just-in-time Compiler that* converts all of the bytecode into native machine code just as a Java program

JVM – Java Virtual Machine. The part of the Java Runtime Environment responsible for interpreting bytecodes.

LITERAL- The basic representation of any integer, floating point, or character value. For example, 3.0 is a double-precision floating point literal, and "a" is a character literal.

LOCAL VARIABLE- A data item known within a block, but inaccessible to code outside the block. For example, any variable defined within a method is a local variable and can't be used outside the method.

Long - A Java programming language keyword used to define a variable of type long.

Member - A *field* or *method* of a class. Unless specified otherwise, a member is not static.

Method - A function defined in a class. See also *instance method*, *class method*. Unless specified otherwise, a method is not static.

Mosaic - A program that provides a simple GUI that enables easy access to the data stored on the Internet. These data may be simple files or hypertext documents. Mosaic was written by a team at *NCSA*.

New - A Java programming language keyword used to create an instance of a class.

Null - The null type has one value, the null reference, represented by the literal null, which is formed from

ASCII characters. A null literal is always of the null type.

Object - The principal building blocks of object-oriented programs. Each object is a programming unit consisting of data and functionality.

Package - A group of *types*. Packages are declared with the package keyword.

Pixel - The picture element on a display area, such as a monitor screen or printed page. Each pixel is individually accessible.

Primary Key - An object that uniquely identifies an entity bean within a home.

Property - Characteristics of an object that users can set, such as the color of a window.

Remote Interface - One of two interfaces for an enterprise bean. The remote interface defines the business methods callable by a client.

Rollback - The point in a transaction when all updates to any databases involved in the transaction are reversed.

Root - In a hierarchy of items, the one item from which all other items are

descended. The root item has nothing above it in the hierarchy.

Short - A Java programming language keyword used to define a variable of type short.

Single Precision - In the Java language specification, describes a floating point number with 32 bits of data. See

SGML - Standardized Generalized Markup Language. A standard that specifies a way to annotate text documents with information about types of sections of a document.

SQL - Structured Query Language. The standardized relational database language for defining database objects and manipulating data.

System Administrator - The person responsible for configuring and administering the enterprise's computers, networks, and software systems.

Static - A Java programming language keyword used to define a variable as a class variable. Classes maintain one copy of class variables regardless of how many instances exist of that class. "static" can also be

used to define a method as a class method. Class methods are invoked by the class instead of a specific instance, and can only operate on class variables.

Static Field - Another name for *class variable*.

Static Method - Another name for *class method*.

Subarray - An array that is inside another array.

Subclass - A class that is derived from a particular class, perhaps with one or more classes in between.

Subtype - If type X *extends* or implements type Y, then X is a subtype of Y. *superclass* - A class from which a particular class is derived, perhaps with one or more classes in between.

Super - A Java programming language keyword used to access members of a class inherited by the class in which it appears.

Supertype - The super types of a type are all the interfaces and classes that are extended or implemented by that type.

Switch - A Java programming language keyword used to evaluate a variable that can later be matched with a value specified by the "case" keyword in order to execute a group of statements.

UNICODE - A 16-bit character set defined by ISO 10646. All source code in the Java programming environment is written in Unicode.

URI - Uniform Resource Identifier. A compact string of characters for identifying an abstract or physical resource.

URL - Uniform Resource Locator. A standard for writing a text reference to an arbitrary piece of data in the

Variable - An item of data named by an identifier. Each variable has a type, such as int or Object, and a scope.

Virtual Machine - An abstract specification for a computing device that can be implemented in different ways, in software or hardware.

Web Server - Software that provides services to access the Internet, an intranet, or an extranet. A Web server hosts Web sites, provides support for

HTTP and other protocols, and executes server-side programs that perform certain functions.

While - A Java programming language keyword used to declare a loop that iterates a block of statements. The loop's exit condition is specified as part of the while statement.

WWW - (World Wide Web) The web of systems and the data in them that is the Internet.

XML - Extensible Markup Language. A markup language that allows you to define the tags needed to identify the data and text in XML documents.

CBSE AISSCCE 2016-17

Informatics Practices (065)

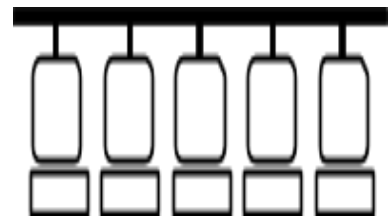
1 (a) How do Computer networks reduce hardware costs of an organization? Explain with the help of example. 2

Ans Computer network allows sharing of hardware resources thereby reducing hardware costs of an organization. For example, a printer can be shared among the users in a network so that there's no need to have individual printers for each and every computer in the network.

(b) Compare BUS topology with STAR topology. Give example. 2

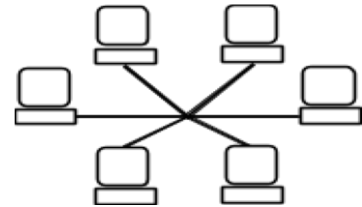
BUS TOPOLOGY

- In Bus topology all the nodes are joined to one cable.
- If the main cable (backbone) fails, the entire network is affected.
- Fault diagnosis is difficult.
- Less cable length required.
- Performance is low as when more nodes are connected, data collisions can occur.



STAR TOPOLOGY

- In Star topology each node has its own cable that connects to a switch or hub.
- If the central hub/switch fails, the entire network fails.
- Fault diagnosis is easy.
- More cable length is required.
- Performance is high as no data collisions can occur.



(c) Why switch called an intelligent hub? When is a repeater used in a computer network?

Ans 1. switch is called an intelligent hub as it forwards the data packets only to the intended nodes.

2. A repeater is used when the signals get weakened or distorted by transmission over long distances.

(d) Expand following terms: i) OSS ii) HTTP 2

Ans i) Open Source Software ii) HyperText Transfer Protocol

(e) Explain the terms Firewall and Cyber Law. 2

Ans Firewall: A Firewall is a hardware/software that permits only authorized data to enter/leave the network.

Cyber Law: Cyber Law is the law that deals with offences related to data /information stored on computers or networked devices/solutions.

2 (a) Write the value that will be assigned to variable C after executing the following statement:

$C = 25 - 5 * 4 / 2 - 10 + 4;$ 1

Ans 9

(b) Consider the statement:

`first_name = "Ayana";`

What is the datatype of first_name ? ii) Is 325 the same as “321” ? Give reason. 1

Ans String data type ii) No, 325 is a Number/Integer while “321” is a String.

(c) Radhika changed the “Text” property of a Checkbox named jCheckBox1 to “Reading”.

What change (if any) will be reflected in its name property? 1

Ans No change will be reflected in its name property.

(d) Ariya has typed the following comments. Write the comments using another way.

`//This is a comment spreading`

`//over two lines` 1

Ans `/*This is a comment spreading over two lines or more */`

(e) Given below is HTML code. Rewrite the correct code underlining all the corrections done2

`<ol type = “A” start=“D”> <li>Bake in oven for an hour <li>Remove from oven <li>Serve`

Ans `<ol type = “A” start=“4”>`

`<li>Bake in oven for an hour <li>Remove from oven <li>Serve </ol>`

(f) Explain the meaning of the following statement with the help of example. “Tags are not predefined in XML” 2

Ans “Tags are not predefined in XML”. It means that there are no standard tags in

XML and they are created by the user. Example : To store name , the tag `<name>` may be used as : `<name> Amit </name>` In the above example, `<name>` is not a standard tag. It has been created by the user.

(g) Name two properties and two methods that are common in JTextField and JLabel. 2

Ans Properties: background, enabled, font, foreground, text

Methods: setBackground(), isEnabled(), setText(), getText()

3(a) What is the relationship between SQL and MySQL? 1

Ans SQL stands for Structured Query Language. It’s a standard language for accessing and manipulating databases. MySQL is a Relational Database Management System (RDBMS), like SQL Server, Oracle, Informix, Postgres, etc. MySQL is a RDBMS.

(b) Write SQL statement that gives the same output as the following SQL statement but uses 'IN' keyword. 1

SELECT NAME FROM STUDENT WHERE STATE = 'VA';

Ans SELECT NAME FROM STUDENT WHERE STATE IN ('VA');

(c) Which one of the following SQL queries will display all Employee records containing the word "Amit", regardless of case (whether it was stored as AMIT, Amit, or amit etc.)? 1

(i) SELECT * from Employees WHERE EmpName like UPPER '%AMIT%';

(ii) SELECT * from Employees WHERE EmpName like '%AMIT%' or '%AMIT%' OR '%amit%';

(iii) SELECT * from Employees WHERE UPPER(EmpName) like '%AMIT%';

Ans (iii) SELECT * from Employees WHERE UPPER(EmpName) like '%AMIT%';

(d) If there are 10 rows in 'Emp' table and 5 rows in 'Department' table, How many rows will be displayed by the following query? SELECT * FROM Emp, Department; 1

Write the term used for the Join being used on the two tables mentioned above.

Ans 50 rows. Cartesian product or Cross join or Cartesian join

(e) Kunal has entered the following SQL command on Table 'STUDENT' that has TotalMarks as one of the columns. SELECT COUNT(*) FROM STUDENT; 2

The output displayed is 20. Then, Kunal enters the following command:

SELECT COUNT(*) FROM STUDENT WHERE TotalMarks < 100;

The output displayed is 15.

Then, Kunal enters the following command:

SELECT COUNT(*) FROM STUDENT WHERE TotalMarks >= 100;

He predicts the output of the above query as 5. Do you agree with Kunal? Give reasons for your answer.

Ans Yes, Total rows=20, rows with TotalMarks <100 is 15, so remaining rows left are 20-15=5

(f) In a hospital, Patients are allocated to wards. A database named 'Hospital' is created. One table in this database is: WARD with WardId, WardName, NumOfBeds as columns and WardId as the primary key. Write another suitable table you could expect to see in 'Hospital' database, with 3 suitable columns identifying Primary key and Foreign key. 2

AnsExample:

Table - Patient

Columns - PatientId,

PatientName, WardId,

Patient Id - PRIMARY KEY,

WardId - FOREIGN KEY

(g) Given below is the 'Department' table:

DEPCODE	DEPNAME
101	ADMIN
102	RECEPTION
103	PERSONNEL

SET AUTOCOMMIT = 0;

UPDATE Department SET DEPNAME = 'OFFICE' WHERE DEPNAME = 'ADMIN';

INSERT INTO Department VALUES(104,'HRD');

UPDATE Department SET DEPNAME = 'FRONT OFFICE' WHERE DEPNAME = 'RECEPTION';

COMMIT;

DELETE FROM Department WHERE DEPNAME = 'FRONT OFFICE';

ROLLBACK;

SELECT * FROM Department;

What will be the output of the above given SELECT statement?

Ans	DEPCODE	DEPNAME
	101	OFFICE
	102	FRONT OFFICE
	103	PERSONNEL
	104	HRD

4(a) Write the values of c and d after execution of following code: int a = 1; int b = 2; int c; int d; c = ++b; d = a++; c++; 1

Ans c = 4 d = 1

(b) What is the difference between getSelectedIndex() and getSelectedItem() methods? 1

Ans getSelectedIndex() retrieves index of selected item whereas getSelectedItem() retrieves selected item.

(c) What will be displayed in jTextField1 after the following code is executed? Also write how many times the loop will execute. a = 5; b = 2; 1

While (b != 0)

```
{ r = a%b; a =
  b; b = r; }
```

jTextField1.setText(""+a);

Ans jTextField1 will display 1

(d) Write the values that will be assigned to x, y, z and t after executing the following Java code: 2

String s1, s2, s3, x, y, z;

int t;

S1 = "classxii"; S2 = "cbseboard"; S3 = "aisse2016";

```
x = s1.substring(5, 8); y = s2.concat(s1); z = s3.trim(); t = z.length();
```

Ans x = xii y = cbseboardclassxii z = aisse2016 t=9

(e) Write the value that will be stored in variable num and sum after execution of following code: 2

```
int sum=0, num = -2;
do {
    sum = sum + num; num++; } while (num < 1);
```

Ans num = 0 sum = -3

(f) The following code has error(s). Rewrite the correct code underlining all the corrections made 2

```
integer counter=0;
for(num =i; num>=1; num--); {
    If i%num = 0 {
        counter = counter + 1;
    }
}
```

Ans int num;
int i;
int counter=0;
for(num =i; num>=1; num--)semicolon deleted

(g) Ms. Angela works as a programmer in a Bus Tour Company named “Heritage Experiences”. Groups of people come and reserve seats. There are 3 stopovers for the bus. First stop is at Alwar, second at Jaipur, third at Udaipur. A group may choose any one destination out of Alwar, Jaipur and Udaipur. Angela has designed a software to compute charges to be paid by the entire group. A screenshot of the same is shown as:

A group can opt for one destination out of Alwar/ Jaipur/ Udaipur. If the group is “Frequent Traveller Group”, the group gets a 10% discount on Total charges.

Help Ms. Angela in writing the code to do the following:

- I. After selecting appropriate Radio Button and checkbox (if required), when Calculate Charges’ button is clicked, ‘Total Charges’, ‘Discount Amount’, ‘Amount to Pay’ should be calculated and displayed in the respective text fields. The Charges per person for various destinations are as follows:

Destination	Amount(in Rs.)
Alwar	200.00 per person
Jaipur	500.00 per person
Udaipur	900.00 per person

‘Total Charges’ is obtained by multiplying ‘Number of People in Group’ with Amount per person.

- II. If 'Frequent Traveller Group' checkbox is selected, 'Discount Amount' is calculated as 10% of 'Total Charges'. Otherwise 'Discount Amount' is 0.
- III. 'Amount to Pay' is calculated as : $\text{Amount to Pay} = \text{Total Charges} - \text{Discount Amount}$.

Ans Double Total = 0;
 if (jRadioButton1.isSelected())
 Total= 200* Integer.parseInt(jTextField2.getText());
 else if (jRadioButton2.isSelected())
 Total= 500* Integer.parseInt(jTextField2.getText());
 else if (jRadioButton3.isSelected())
 Total= 900* Integer.parseInt(jTextField2.getText());
 jTextField3.setText("" + Total);
 double Disc, Net;
 if(jCheckBox1.isSelected())
 Disc = 0.10* Integer.parseInt(jTextField3.getText());
 else
 Disc = 0.0;
 jTextField4.setText(" "+Disc); Net = Total-Disc; jTextField5.setText(" "+net);

- (ii) When 'CLEAR' button is clicked, all the textfields, radio button and checkbox should be cleared. 1

Ans jTextField1.setText("");
 jTextField2.setText("");
 jTextField3.setText("");
 jTextField4.setText("");
 jTextField5.setText("");
 jCheckBox1.setSelected(false);
 jRadioButton1.setSelected(false);
 jRadioButton2.setSelected(false);
 jRadioButton3.setSelected(false);

- iii When 'EXIT' button is clicked, the application should close.

System.exit(0);

- 5(a) Consider the table given below.

Write Answer to (i). Write SQL queries for (ii) to (viii) and output for SQL queries (ix) and (x).

(Table: Salesperson)

SID	Name	Phone	DOB	Salary	Area
S101	Amit Kumar	98101789654	1967-01-23	67000.00	North
S102	Deepika	99104567834	1992-09-23	32000.00	South
S103	Vinay	98101546789	1991-06-27	35000.00	North
S104	Kumar	88675345789	1967-10-16	40000.00	East
S105	Rashmi	98101567434	1972-09-20	50000.00	South

NOTE : Columns SID and DOB contain Sales Person Id and Data of Birth respectively.
 Write the data types of SID and DOB columns. 1

Data type of SID : varchar/char

Data type of DOB : Date

- (ii) Display names of Salespersons and their Salaries who have salaries in the range 30000.00 to 40000.00 1

Ans SELECT Name,Salary FROM Salesperson
WHERE (Salary BETWEEN 30000 AND 40000); OR
SELECT Name,Salary FROM SalesPerson
WHERE (Salary>=3000 AND Salary<=4000);

- (iii) To list names, phone numbers and DOB (Date of Birth) of Salespersons who were born before 1st November, 1992. 1

Ans SELECT Name,Phone,DOB FROM Salesperson
WHERE (DOB <'1992-11-01'); OR
SELECT Name,Phone,DOB FROM Salesperson
WHERE (DOB < 19921101);

- (iv) To display names and salaries of salespersons in descending order of salary. 1

Ans SELECT Name,Salary FROM Salesperson ORDER BY Salary DESC;

- (v) To display areas in which Salespersons are working. Duplicate areas should not be displayed. 1

Ans SELECT DISTINCT Area FROM Salesperson;

- (vi) To display SID, Names along with Salaries increased by 500. (Increase of Rs.500 is only to be displayed and not to be updated in the table) 1

Ans SELECT SID, Name,Salary+500 FROM Salesperson;

- (vii) To display Area along with number of Salespersons working in that area. 1

Ans SELECT Area, COUNT(*) OR COUNT(SID)
FROM Salesperson GROUP BY Area;

- (viii) To display Names of Salespersons who have the word 'Kumar' anywhere in their names.

Ans SELECT Name FROM Salesperson
WHERE Name LIKE '%Kumar%';

- (ix) SELECT Name, LENGTH(Name) FROM Salesperson; 1

Name	LENGTH(Name)
Amit Kumar	10
Deepika Sharma	14
Vinay Srivastav	15
Kumar Mehta	11
Rashmi Kumar	12

- (x) SELECT Area, COUNT(*) FROM Salesperson
GROUP BY Area HAVING COUNT(*) > 1; 1

Area	COUNT(*)
North	2
South	2

- 6 "ABC" Event Management Company requires data of events that are to be organized. Write SQL query to create a table 'Event' with the following structure: 2

Field	Type	Constraint
EventId	Integer	Primary key

Event Varchar(50)
 DateEvent Date
 NumPerformers Integer

Ans CREATE TABLE Event

(EventId INTEGER PRIMARY KEY, Event VARCHAR(50), DateEvent DATE,
 NumPerformers INTEGER);

(b) Consider the tables given below and answer the question that follows

Table: Workshop

WorkshopId	Title	NumSpeake	MeantFor	Fee
551	Time Management	3	Senior Manager	7000
553	App Development	1	Computer Programmer	9000
554	Planning	2	Senior Manager	8000
556	Marketing Strategies	2	Junior Manager	9000

i. WorkshopId '552' is missing in the table Workshop. Is there any discrepancy (something not correct) ? Give reason for your answer. 1

ii WorkshopId '551' is present twice in the table Participant. Is there any discrepancy? Give reason for your answer 1

Ans i. There is no discrepancy if 552 is missing. It is not necessary that all workshop ids maintain a sequence.

ii. There is no discrepancy if 551 is present twice as more than one participant may attend the same workshop.

NOTE: WorkshopId is a foreign key column in the Participant table, so it can store duplicate values, may also be accepted.

(c) With reference to the above given tables (in Q.6-(b), Write commands in SQL for (i) to (iii) given below : 6

(i) To display names of Participants along with workshop titles for only those workshops that have more than 2 speakers.

Ans SELECT Name, Title FROM Participant, Workshop

WHERE Participant.Workshopid =Workshop.Workshopid AND Numspeakers > 2;

OR

SELECT Participant.Name, Workshop.Title FROM Participant, Workshop

WHERE Participant.Workshopid =Workshop.Workshopid AND

Workshop.Numspeakers > 2;

(ii) To display ParticipantId, Participant's name, WorkshopId for workshops meant for Senior Managers and Junior Managers.

Ans SELECT ParticipantId, Name,Workshopid FROM Participant, Workshop

WHERE Participant.Workshopid = Workshop.Workshopid AND Meantfor = 'Senior Manager' OR Meantfor = 'Junior Manager';

OR

```
SELECT Paricipant.ParticipantId, Participant.Name, Participant.WorkshopId
FROM Participant, Workshop WHERE Participant.WorkshopId =
Workshop.WorkshopId AND Workshop.Meantfor = 'Senior Manager'
```

(iii) To display WorkshopId, title, ParticipantId for only those workshops that have fees in the range of 5000.00 to 8000.00

Ans

```
SELECT Workshop.WorkshopId, Title, ParticipantId FROM Participant, Workshop
WHERE Participant.WorkshopId = Workshop.WorkshopId AND Workshop.Fee
BETWEEN 5000 AND 8000;
```

OR

```
SELECT P.WorkshopId, W.Title, P.ParticipantId FROM Participant P, Workshop W
WHERE P.WorkshopId = W.WorkshopId AND Fee BETWEEN 5000 AND 8000;
```

7 (a) Define e-governance. 2

Ans Using technology to deliver Government services.

(ii) List two advantages of e-governance to a disabled person. 1

Ans Advantages of e-governance

1. They get access to Government related information online without having to travel long distances.
2. They become aware of the opportunities/schemes especially meant for them.

(b) How does E-business help organizations to provide better customer services? 1

Ans Organizations are able to offer services and support to customers 24x7. Organizations analyze customer's reviews about their products/services and keep improving them.

(c) Ms. Fauzia is creating a form for an application to be used in a Gym. Help her to choose most appropriate controls from ListBox, ComboBox, TextField, TextArea, RadioButton, CheckBox, Label and Command Button for the following entries. 2

S.No.	Function
1	To Enter Name
2	To enter EMAIL ID
3	To allow user to choose any one MEMBERSHIP DURATION out of 1 Month, 3 Months, 6 Months, 1 year.
4	To choose PRE-EXISTING MEDICAL CONDITIONS out of Diabetes, Heart Disease, Chest Pain, Shortness of Breath, Epilepsy, Others.

Ans.

S.No	Function Control
1	TextField
2	TextField
3	Radio Button/Combo Box
4	List Box/Check Box

Roll No.

--	--	--	--	--	--

Class XII (Sample Paper)**Subject: Informatics Practices (065)****Time: 3 Hrs.****M.M. 70****Instructions:****All Questions are compulsory.**

- 1.(a) ABC college has three departments that are to be connected into a network. Which of the following communication medium (out of the given option), should be used by the college for connecting their departments for very effective High Speed communication? 2
 1. Coaxial Cable 2. Optical Fiber 3. Ethernet Cable
- (b) What are DoS attacks?. 2
- (c) Define the following: 2
 i) ODF ii) Ogg Vorbis iii) TTF iv) OTF
- (d) Which of the following (i) is not a broadcast device (ii) offers a dedicated bandwidth? 2
 i) Repeater ii) bridge iii) hub iv) switch
- (e) What is the difference between the terms 'http' and 'https'. 2
- (f) What is Proprietary Standards and Open Standards? 1
- (g) What is Cyber Crime. Write down different laws about Cyber Crime 2
- 2.(a) Identify the odd one out of the following Java Statement. State reason for your answer. 1
 a) if b) while c) switch d) class
- (b) Differentiate between Single Interval and Multiple Interval in List. 1
- (c) State invalid variable names out of the following. State the reason, if invalid. 1
 i) Roll no ii) INT iii) _marks iv) class
- (d) What is the difference between getText() and setText() Function. 1
- (e) Define the following HTML Tags with proper example. 2
 1. TD 2. IMG SRC 3. TABLE 4. COLSPAN
- (f) What is the difference between XML and HTML 2
- (g) Rewrite the following code using switch statement: 2
 If(code==1)
 Day="Monday";
 else if (code==2)
 Day="Tuesday";
 else if (code==3)
 Day="Wednesday";
 else if (code==4)
 Day="Thursday";
 else
 Day="No Match";
- 3.(a) Differentiate between unique and primary key constraint. 1

- (b) Mr. Vats Created the following table with the name as “Student”

1

AdmNo	Name	DOB
1222	Rajesh Kumar	1980-21-02

Now, he wants to add a new column. Write a SQL statement.

- (c) Mr. Ram is working on SQL. He wants to insert the new value in the table “STUDENT”, but an error is being displayed. Write the correct SQL statement. Insert into(“122”,Santosh,”Sandeep Singh”)

1

- (d) What do you understand by MySQL Client?

1

- (e) Define the following SQL Function with example:

2

CONCAT() TRIM() SUBSTR() TRUNCATE()

- (f) What is Degree and Cardinality? Define with proper example.

2

- (g) How many times will the following loops execute? Which one of them is Entry Control and which one is Exit Control.

2

Loop 1 int i=10,sum=0; while(i>1) { Sum+=i; i-=3; }	Loop 2 int i=10,sum=0; do { Sum+=i; i-=3; } while(j>1);
--	--

- 4.(a) What does round () return if a negative float value is passed to it?

1

- (b) What is the advantage of inheritance?

1

- (c) Write the statement for make the jTextField1 un-editable.

1

- (d) What will be the content of jTextArea1 and jTextField1 after the execution of the following statements?

2

- a. jTextArea1.setText(“Go\tGreen\nIndia”);
b. String Message=“Digital India”;
jTextField1.setText((Message.Length()-5)+””);

- (e) Rewrite the code after removing the errors (if any).

2

```
int y=6,p;
do{
y=3.14*y;
p=y%10;
if p=2 System.out.print(“Two”);
while(y>1)
```

- (f) Rewrite the following code using while loop :

2

```
int i,j;
for(i=1;i<=4;i++){
for(j=1;j<=i;j++){
System.out.print(j); }
System.out.println();}
```

- (g) Mr. Ram Singh, the owner of the Kiddiland Enterprises has asked his programmer Sharma to develop the following GUI in Netbeans:

Mr. Singh accept payment through types of credit cards. The discount is given according to the following

Type of Card	Discount
Platinum	20% of Amount
Gold	15% of Amount
Silver	10% of Amount

scheme.

If the amount is more than 25000/- then the customer gets an additional offer of 5%.

Write Java Code for the following:

- To assign Additional Discount as 0 (jTextField4) and Net amount as 0 (jTextField5). Also set them as un-editable. 2
- To calculate discount as per the given criteria and display the same in jTextField3. 2
- To calculate Net Amount (Total Cost-Discout-Additional Discount). 2

- 5.(a) Differentiate between single row and aggregate function with proper example. 2

- (c) Consider the table TEACHER given below. Write commands in SQL for (i) to (iv) and output for (v) to (viii) 6

Teacher						
ID	Name	Deptt	Hiredate	Desig	Gender	Salary
1.	Tanya	S.St.	1994-03-17	PGT	F	25000
2.	Saurabh	Art	1990-02-12	TGT	M	20000
3.	Nandita	Eng	1980-05-16	PRT	F	30000
4.	James	Eng	1989-10-16	PRT	M	25000
5.	Jaspreet	Hindi	1990-08-01	TGT	F	22000
6.	Disha	Math	1980-03-17	PGT	F	21000
7.	Siddarth	Comp	1994-09-02	PGT	M	27000
8.	Sonali	Comp	1980-11-17	PRT	F	24500

- To display all information about teachers of PGT Desig.
- To List the names of female teachers of Hindi Deptt.
- To list names, departments and date of hiring of all the teachers in ascending order of date of joining.
- To count the number of teachers in Eng deptt.
- SELECT MAX(Hiredate) from teacher.
- SELECT DISTINCT(Desig) from teacher.
- SELECT COUNT(*) from teacher where design="PGT".
- SELECT AVG(Salary) from teacher group by teacher.

- (b) Find the output of the following SQL Queries: 2
- SELECT DAYOFMONTH('2009-08-25');
 - SELECT CEIL(6.5675);
 - SELECT MID('CLASS 12, 2,3');
 - SELECT FLOOR(45.343);

- 6.(a) Write SQL Query to create a table ITEM with the following structure. 2

Field	Data Type	Constraint
ITEM NO	Integer	
ITEM Code	Integer	Primary Key
Price	Decimal	Not Null
City	Char	

- (b) What are the steps in JDBC Connection? 2
- (c) What is the difference between COMMIT, ROLLBACK and SAVEPOINT 3
- 7.(a) Write down the positive or negative societal impact of e-governance and e-business. 2
- (b) How is e-learning beneficial for student? Write one point. 1
- (c) Abhi works for the customs Department. He wishes to create controls on a form for the following functions. Choose appropriate controls from Text Field, Option Button, Check Box, List Box, Combo Box, Button and write in the third column. 2

S.No.	Control used to	Control
1	Enter Last Name	
2	Enter Gender	
3	Choose City from a list of cities	
4	Submit Form	

Marking Scheme
Sample Paper
Informatics Practices (065)

1.(a)	Optical Fiber	2
(b)	Denial of Attack (DoS) attacks are those attacks that prevent the legitimate users of the system, from accessing or using the resources, information or capabilities of the system.	2
(c)	ODF refers to an open document file format for saving and exchanging office documents such as memos, reports, spreadsheet, database etc. Ogg Vorbis is a new audio compression format. It is roughly comparable to other formats used to store and play digital music such as MP3, VQF and other digital format. It is different from other formats because it is completely free, open and unpatented. TTF (True Type Font) is a font format developed by Apple and licensed to Microsoft. True Type is the native Operating System Font Format for Windows and Mac OS. It is normally 8 bit fonts. OTF (Open Type Font) format is an extension of the True Type Font format. Open Type fonts are 16 bit fonts. This font allow the handling of large glyph sets using Unicode encoding.	$\frac{1}{2}$ $\frac{1}{2}$
(d)	(i) (b) Bridge is not a broadcast device, as it filters traffic depending upon the receiver's MAC address. (ii) (d) Switch offers dedicated bandwidth.	2
(e)	http is a technical acronym that means 'hypertext transfer <u>protocol</u>', the language of web pages. When a web page has this prefix, then your links, text, and pictures should work in your web browser. https is 'hypertext transfer protocol SECURED'. This means that the web page has a special layer of encryption added to hide your personal information and passwords. Whenever you log into your online bank or your web email account, you should see https at the front of the page address.	1 1
(f)	Proprietary standards are those for which users have to buy license to use them. For e.g. MS Office format .doc, .ppt, .xls etc Open Standards are internationally accepted technical standards that guarantee that data can be Exchanged across platforms and for any applications. Open is feely open to all.	1
(g)	1 Mark for definition and one mark for law.	2
2.(a)	d) Class, it a data structure and all other are the parts of control structure.	1
(b)	Single Interval and Multiple are the property of List. Single Interval allow to select the list item continuously. Multiple Interval property allow to select the list item multiple at a time randomly.	$\frac{1}{2} + \frac{1}{2}$
(c)	Roll No, Class are invalid	1
(d)	getText() function is used to get the response from the user. setText is used to display the output on screen or application.	1
(e)	TD: Used to enter data in to the Table. IMG SRC: used to insert the image in to the web page. Table: Used to frame the table without border.	2

	* ½ marks for each correct answer	
(f)	1 mark for each correct answer.	2
(g)	<pre> switch(code) { case 1: Day="Monday"; Break; case 2: Day="Tuesday"; Break; case 3: Day="Wednesday"; Break; case 4: Day="Thursday"; Break; default: Day="No Match"; } </pre>	2
3.(a)	Unique key constraint can remain null, but primary key constraints must have the value.	1
(b)	1 marks of correct answer.	1
(c)	Insert into student values(122,"Santosh","Sandeep Singh");	1
(d)	MySQL Clients are programs that connect to MySQL Server and issue queries in predefined format.	1
(e)	½ mark for each correct definition.	2
(f)	1 mark for definition and 1 marks for example.	2
(g)	4,1 Loop 1 Entry Control Loop 2 Exit Control	2
4.(a)	Closest int value	1
(b)	Inheritance is used to access the property of base class in to derive class.	1
(c)		1
(d)	a. Go India b. 8 Green	1
(e)	<pre> int y=6,p; do{ y=3.14*y; p=y%10; if (p==2) System.out.print("Two"); }while(y>1); </pre>	2
(f)	<pre> int i=1,j; while(i<=4){ j=1; while(j<=i){ </pre>	2

	<pre> System.out.print(j); ++j; } i++; System.out.println(); } </pre>	
(g)	a. jTextField4.setText("0"); jTextField5.setText("0"); jTextField4.setEditable(false); jTextField5.setEditable(false); b. double dis=0; double amt=Double.parseDouble(jTextField2.getText()); if(jRadioButton1.isSelected()==true) dis=amt*0.20; else if(jRadioButton2.isSelected()==true) dis=amt*0.15; else dis=amt*0.10; jTextField3.setText(""+dis); double add; if(jTextField2>25000) add=amt*0.05; jTextField4.setText(""+add); jButton2.setEnabled(true); c. double Totalcost=Double.parseDouble(jTextField2.getText()); double Totalcost=Double.parseDouble(jTextField3.getText()); double additinoaldiscount=Double.parseDouble(jTextField4.getText()); double netamount=Totalcost-discount-Additionaldiscount; jTextField5.setText(""+netamount);	2 2 2
5.(a)	1 mark for each definition.	2
(b)	Find the output of the following SQL Queries: I. 25 II. 7 III. las IV. 45	2
(c)	i. SELET * FROM teacher where category='PGT'. ii. SELECT name FROM teacher WHERE Gender='F' AND Deptt='Hindi'. iii. SELECT name, Deptt, Hiredate from teacher order by hiredate. iv. SELECT count(*) from teacher where Deptt='Eng' v. 1994-09-02 vi. TGT PRT PGT vii. 3 viii. 24500 24000	1 1 1 1 ½ ½ ½ ½
6.(a)	Create table ITEM (Item_No integer, Item_Code Integer primary key, Price Decimal(4,2) not null, City varchar(12));	½ for each corr

		ecto in
(b)	While making a JDBC connection we go through the following steps:- Step-1 Register the database driver by using: Class.forName("\driver classes for that specific database\"); Step-2 Now Create a database connection using: connection con=DriverManager.getConnection(url,username,password); Step-3 Now create a query using: Statement stmt=connection.createStatement("\select * from table name;\") Step-4 Execute the query: Stmt.executeUpdate();	2
(c)	COMMIT :-The commit statement is used to end a transaction and make all changes permanent. Until a transaction is committed, other user cannot see the changes made to the database by the transactions COMMIT ROLLBACK : The rollback statement is used to end a transaction and undo the work done by that transaction. That is, The rollback statement cancels the entire transaction. SAVEPOINT :-savepoint statement defines a marker in a transaction. These markers are useful in rolling back the transaction till the marker.	1 1 1
7.(a)	At least one Positive and one negative impact of both.	1+1
(b)	Student can learn at their own pace. (any one point)	1
(c)	1. Text Field 2. Option Button 3. Combo Box or List Box 4. Command Button	½ * 4=2