

**OBJECTIVE**

**Ghazali**

**SUBJECTIVE**

**A-One Guide**

**GRADE - 8**



**INDEX - COMPUTER EDUCATION**

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**GHAZALI A-ONE GUIDE (URDU MEDIUM) 267 COMPUTER 8**

**UNIT 1: Networks and Communications**

**Solution of Exercise**

- Q1. Tick the correct choice for the following questions.
- A computer network is Interconnection of two or more \_\_\_\_\_ (b) Monitors  
 (a) Printers (d) Hard disks  
 (c) Computers (b)  Computers
  - The data is transferred from one place to another through \_\_\_\_\_  
 (a) Mouse (b) Keyboard  
 (c) Storage device (d)  Transmission media
  - Which of the following is a communication device?  
 (a) Mouse (b)  Modem (c) Monitor (d) Printer
  - Which device is used to send messages, data or information to other devices?  
 (a) Receiving device (b)  Sending device  
 (c) Communication device (d) Input device
  - Which of the following network is confined to a relatively small area?  
 (a) Internet (b) WAN (c) MAN (d)  LAN
  - In WAN, "W" stand for \_\_\_\_\_  
 (a) Width (b) Wire (c)  Wide (d) Whole
  - Which is a powerful computer that facilitates the whole network by providing variety of services to the computer or devices connected to the network?  
 (a)  Server (b) Client (c) PC (d) Laptop
  - \_\_\_\_\_ is an expansion card that enables a computer to connect to a network.  
 (a)  Network Interface Card  
 (b) VGA Card (c) FAX Card (d) Sound Card
  - \_\_\_\_\_ is a type of wire that consists of a center wire surrounded by insulation and then a grounded shield of braided wire.  
 (a) Fiber Optic (b)  UTP  
 (c) STP (d) Coaxial cable
  - Which of the following is the fastest transmission media?  
 (a) UTP cable (b) STP cable  
 (c)  Fiber optic cable (d) Coaxial cable
- Q2. Fill in the blanks.
- A computer network consists of four basic components.
  - In a computer network a receiving device receives messages, data or information from a sending device.
  - Transmission Medium is the channel or path through which the data or information is transferred from one place to another in a computer network.
  - Client is a less powerful computer as compared to server computer that relies on servers for resources.
  - MAN stands for Metropolitan Area Network.
  - Wide Area Network is a very large computer network covering a large geographic area, such as a state, province, country or the whole world.
  - NIC stands for Network Interface card.
  - Bluetooth is a wireless technology for exchanging data between different devices over short distances.
  - Fiber optic cable is a type of cable that uses glass (or plastic) threads to transmit data.
  - (Global Positioning System) is global navigation satellite system.
- Q3. Match Column A with Column B.
- Ans:
- | Column A             | Column B      |
|----------------------|---------------|
| Sending Device       | Coaxial Cable |
| Communication Device | NIC           |
| Transmission Media   | Glass threads |
| Network              | A Computer    |
| Fiber Optic          | Modem         |
- Q4. Give brief answer to the following questions.
- Data communication  
 Ans: The sharing of data among computers is referred as Data Communication. Data communication has enabled us to send and receive data and information from one computer to other computers.
  - Cellular Communication  
 Ans: Cellular communication is a radio communication. It is distributed over a land area called Cell.
  - Satellite Communication  
 Ans: Satellite Communication is a form of wireless communication in which satellites are the main objects. These satellites are commonly called communication satellites.
  - Fiber optic cable  
 Ans: Fiber Optic is a type of cable that uses

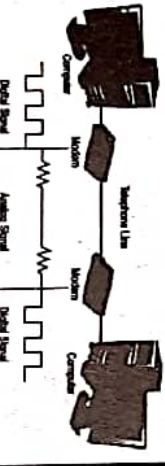
glass (or plastic) threads to transmit data. It consists of a bundle of glass threads, each of which is capable of transmitting messages in the form of light waves.

**ii. Name different types of transmission media.**

- Ans:** There are three common types of transmission media:
1. Twisted Pair Cable
  2. Coaxial Cable
  3. Fiber Optic Cables

**iii. How a Modem works? Show diagrammatically?**

**Ans: Modem: A MODEM (Modulator-Demodulator) is a communication device. It is used to connect to the Internet, exchange information, and to send and receive data from one computer to the other. It translates computer information into a form that can be transmitted over telephone lines. Figure below shows the working of Modem.**



**iv. Differentiate between LAN and WAN.**

LAN	WAN
A Local Area Network (LAN) is a network that a very large computer is confined to a relatively small area. It is generally limited to a geographic area such as a state, province, country or a building or the whole world.	A Wide Area Network (WAN) is a network that covers a large geographic area. It is often connected to multiple smaller common types of networks. Many large networks are usually their own private owned by an organization. WAN is internet.

**v. What is Satellite Communication?**

**Ans: Satellite Communication:** Satellite communication is a form of wireless communication in which satellites are the main objects. These satellites are commonly called communication satellites. Communication satellites are ideally placed to provide the telecommunication links between different places across the globe.

**Q5. Give detailed answers to the following questions.**

**i. Explain different types of physical transmission media.**

**Ans: Types of Physical Transmission Media:** The means through which data is transferred from one place to another is called transmission or communication media. There are three common types of transmission media.

1. Twisted Pair Cable: Twisted pair cables are the most popular transmission media for transferring data on a computer network. They are especially used in the Local Area Networks.
- Twisted pair wires consist of two stands of copper twisted together.
- The twists allow the data signals to travel more as compared to a regular copper wire. The more twists per centimeter, the further the signal can travel. Twisted pair cable is of two types:
  - (i) Unshielded Twisted Pair (UTP): If the wires are unshielded, they are called Unshielded Twisted Pair cables.
  - (ii) Shielded Twisted Pair (STP): If the wires are shielded, they are called Shielded Twisted Pair cables.

**Characteristics of Twisted Pair Cables**

- (i) It is the least expensive type of cable.
  - (ii) It is easy to install.
- 2. Coaxial Cable:** A type of wire that consists of a center wire surrounded by insulation and a shield of braided wire. The shield minimizes electrical and radio frequency interference. Coaxial cabling is the primary type of cabling used by the cable television industry and is also widely used for computer networks. Plastic jacket, insulator, and braided shield in coaxial cable ensure the data transmission without interference from other cables.

**Characteristics of Coaxial Cable:**

- (i) It is more expensive than standard telephone wire.
- (ii) It is much at risk of interference than twisted pair cable.
- (iii) Its data transfer rate is higher than twisted pair cable.
- (iv) It is easy to install.

**3. Fiber Optic Cable:** Fiber Optic is a type of cable that used glass (or plastic) threads to transmit data. It consists of a bundle of glass threads, each of which is capable of transmitting messages in the form of light waves. Fiber optic cable consists of a center glass core surrounded by several layers of protective materials such as cladding and Buffer coating.

**Characteristics of Fiber Optic Cable:**

**(i) It is more expensive as compared to other cables. (ii) It is difficult to install. (iii) The data transfer rate of fiber optic cable is the highest.**

**ii. Explain different types of computer networks.**

**Ans: Types of Computer Networks:** On the basis of geographic distance, computer networks are categorized into the following three types:

1. (Local Area Network) LAN: A Local Area Network (LAN) is a network that is confined to a relatively small area. It is generally limited to a geographic area such as a building or adjacent buildings. LAN is the most common types of network. A computer networks are usually owned by one organization.

**Advantages of LAN:**

- (i) Computers can share peripheral devices like printers, storage device, scanning devices, CD-ROM, etc.
- (ii) User can save their work centrally on the network server.
- (iii) Users can communicate with each other and transfer data between computers very easily. Application package such as a word processor, spreadsheet etc. in the server computer can be shared by all users.
- (iv) Special security measures are needed to stop unauthorized users.
- (v) LANs need to be maintained by skilled personnel.

**2. Metropolitan Area Network (MAN)**

A large computer network which extends to a city or to a metropolitan region is termed as Metropolitan Area Network or MAN. A MAN connects two or more LANs to form a network spread over the whole city. Cable television network in a city is a good example of MAN.

**Advantages of MAN:**

- (i) It is bigger than LAN
  - (ii) It transfers data at high speed.
- Disadvantages of MAN**
- (i) It is expensive.
  - (ii) It is difficult to maintain.

**3. Wide Area Network (WAN):**

A Wide Area Network is a very large computer network covering a large geographic area, such as a state, province, country or the whole world. WANs, often connect multiple smaller networks. Many large organizations develop their own private WANs. An example of WAN is internet.

**Advantages of WAN:**

**(i) In WAN, the user at different locations are connected to a central server. (ii) It is used to monitor distant locations and offices.**

**Disadvantages of WAN:**

- (i) WAN, security is a big issue.
- (ii) Setting up a network can be an expensive and complicated task.
- (iii) Management, maintenance and troubleshooting WAN is a difficult task.

**iii. Describe the following cutting edge technologies:**

**a. GPS**

**Ans: Global Positioning System:** The Global Positioning System (GPS) is global navigation satellite system. This direction-finding system uses satellites to determine precise locations on the surface of the Earth.

GPS can be used to pinpoint any ship or submarine on the ocean, or to measure the height of Mount Everest. It can also be used by armed forces, scientists, fishermen, climbers, hikers and anyone who wants the accurate location and time information.

**b. Bluetooth**

**Ans: Bluetooth:** Bluetooth is a wireless technology for exchanging data between different devices over short distances. It can connect several devices to communicate with each other wirelessly. Networks are usually formed temporarily from portable devices such as cellular phones, handhelds computers and laptops.

Bluetooth offers service like file sharing, voice transport and for connecting devices like mouse, keyboard etc.

**iv. Discuss different components of a computer network.**

**Ans: Components of Computer Network:** A computer network consists of the following four basic components:

**1. Sending Device:**

A device which is used to send messages, data or information to other devices connected to a network. It is called a sending device. In a computer network, a sending device is usually a computer.

**2. Receiving Device:** In a computer network, a receiving device receives messages, data or information from a sending device. The receiving device could be a computer, printer or a storage device.

3. Communication Devices: Communication devices are used for communication between the computers and other devices. Modem is a popular communication device which is used for internet communication.

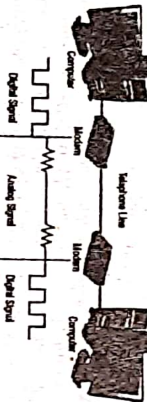
4. Transmission Media: Transmission Media is the channel or path through which the data or information is transferred from one place to another in a computer network. Networks are connected by **wired** or **wireless** transmission medium.

v. What are communication devices? Explain any two of them.

Ans: Communication Devices: Most commonly used communication devices are:

1. **Dialup Modem: A MODEM**

(Modulator-Demodulator) is a communication Device. It is used to connect to the Internet, exchange information, and to send and receive data from one computer to the other. It translates computer information into a form that can be transmitted over telephone lines. Figure below shows the working of modem.



A modem can be located inside or outside the computer. Figure below shows different types of Modem.



In computers, information is stored digitally, whereas, information transmitted over telephone lines is in the form of analog signals. Modem converts digital signals to analog signals (modulation) and then analog signals to digital signals (Demodulation).

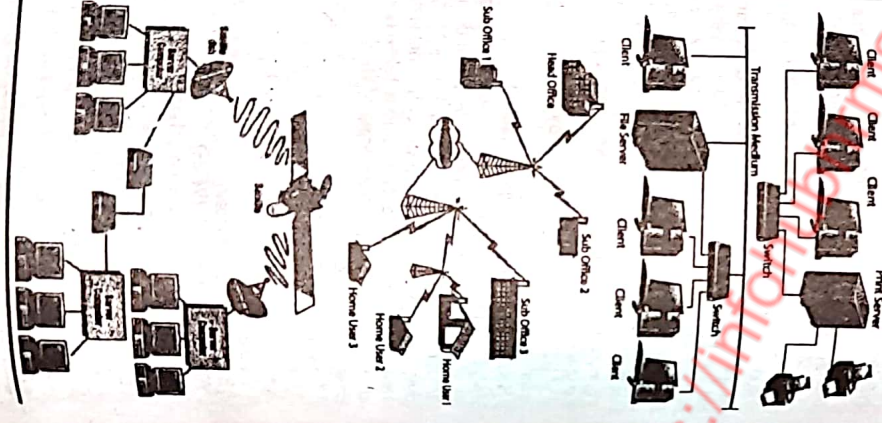
2. **Network Interface Card (NIC):** Network Interface Card (NIC) is an expansion card that enables a computer to connect to a network. Each NIC has a unique serial number. This number is used to identify the computer on the network. A Network Interface Card must be installed in each computer on the network. Figure below shows a Network Interface card.



**Lab Activities**

Lab Activity 1: Make a chart showing different types of Computer Networks and paste it in your Computer Lab.

Ans: These are the different types of computer networks. Draw these on charts and paste in your Lab

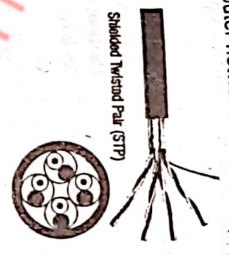


Lab Activity 2: Observe your School Computer Lab and find what type of Computer Network exists in your Lab.

Ans: After observing your computer LAB, you will find LAN type of network exists in your LAB.

Lab Activity 3: Which transmission media and communication devices are used in your School Lab Computer Network? Draw their shapes in your notebooks.

Ans: Transmission Media used in my school LAB computer network are twisted pair cable.



Communication devices used in my school LAB computer network are Dial-up Modem and NIC.



Lab Activity 4: Observe and find information, how computers and other devices are connected to each other in your School Computer Lab.

Ans: After observing and collecting the information, you will find that computers and other devices are connected to each other by twisted pair cable and network card.

**OBJECTIVE AND SUBJECTIVE**  
According to new examination system

**MULTIPLE CHOICE QUESTIONS**

1. A cable in which an insulated copper wire covered with mesh conductor with coating plastic on top is called:
  - (a) Unshielded twisted pair cable
  - (b) Shielded twisted pair cable
  - (c) Coaxial Cable
  - (d) Fiber Optic cable
2. In computer network minimum number of computers are:
  - (a) Two
  - (b) Three
  - (c) Four
  - (d) Many
3. A computer network, uses telephone lines, microwaves and satellites links as transmission medium. This network is an example of:
  - (a) LAN
  - (b) MAN
  - (c) WAN
  - (d) WLAN
4. A wireless keyboard is an example of:
  - (a) Cellular communication
  - (b) Satellite communication
  - (c) Infrared communication
  - (d) Bluetooth communication
5. All of the given can be a source of computer viruses except:
  - (a) Flash Drive
  - (b) E-mail attachment
  - (c) Pirated software
  - (d) GPS

**OPEN ENDED QUESTIONS**

1. (a) Why do we use computer networks?  
 Ans. We use computer network because we can share computer resources such as printers, disk drives etc. We can also exchange information between computers by using computer network.
- (b) Define Network.  
 Ans. Network: A number of computers connected together to communicate with each other through a communication medium is called network.
- (c) Write the names of network types.  
 Ans. Types of network: Following are the names of network types:  
 (i) LAN (Local Area Network)  
 (ii) WAN (Wide Area Network)  
 (iii) MAN (Metropolitan Area Network)

**UNIT 2: Computer Security Threats**

**Solution of Exercise**

Q1. Tick the correct choice for the following questions.

- I. Which of the following is a malicious program that replicates and spread independently and harms the computer?
  - (a) Virus (b) Worm (c) Adware (d) Spyware
- II. Which malicious program records users' behaviour on the Internet, display ads and can even download other malicious software on to the computer?
  - (a) Virus (b) Spyware (c) Adware (d) Worm
- III. A website that is set up to spread a virus or for some other unethical purpose is called an \_\_\_\_\_
  - (a) Secure Website (b) Non-informative website (c) Informative website (d) Insecure website
- IV. Which of the following is a computer program that detects, prevents and takes action to deactivate or remove malicious programs?
  - (a) Virus program (b) Operating system (c) Antivirus program (d) Word processor
- V. \_\_\_\_\_ contains the information about malware which can be used to identify them.
  - (a) Virus definition file (b) Word file (c) Excel file (d) E-mail attachment

VI. Which of the following is a common source of spreading viruses in computers?

- (a) Infected flash drives or disks
  - (b) E-mail attachments
  - (c) Surfing insecure websites
  - (d) Installing Pirated Software
- Ans. \_\_\_\_\_ is the unauthorized use of computer network and its resources.
- (a) Programming (b) Hacking (c) Stealing (d) Robbing

Q2. Fill in the blanks.

- I. An e-mail virus is a computer code sent as an e-mail attachment to other computers.
- II. People who indulge themselves in hacking activities are called hackers.
- III. Some common types of threats to the computers are Virus, Worms, Hackers and Adware.
- IV. Software which has been duplicated and distributed without authorization is called pirated software.
- V. Adware is software which automatically plays, displays, or downloads advertisements a computer usually without user's knowledge.

Q3. Match Column A with Column B.

Column A	Column B
Virus	Current viruses
Hacker	Malicious program
Pirated Software	Steals Password
Virus Definitions	AVG
Antivirus	Illegal Copying

Q4. Give brief answers to the following questions.

I. List some effects/indicators of security threats.

- (i) The computer runs slower than usual
- (ii) The computer locks up or stops responding
- (iii) The computer suddenly restarts on its own
- (iv) Frequently used programs become suddenly slow to load and operate.
- (v) Applications and disk drives are suddenly inaccessible.
- (vi) Unusual error messages appear.
- (vii) Unexpected icons appear on the desktop.
- (viii) Antivirus software is disabled or does not run.

II. Differentiate between a virus and a worm.

Virus	Worm
Virus is a program that is designed to spread from file to file on a single PC. It doesn't intentionally try to move to another PC.	A worm is designed to copy itself (intentionally move) from PC to PC via networks, internet etc.

III. How viruses and worms spread through e-mail attachments?

Ans. An e-mail virus is a computer code sent as an e-mail attachment. If activated, it may cause an e-mail effect, such as destroying certain some harmful effect and causing the files on the hard disk and causing the attachment to be forwarded to everyone in the address book. These viruses require the user on double-clicking on the attachment containing address book. This causes the malicious code to mail viruses. This causes the malicious code to mail itself to other people from that computer.

The best defense against e-mail viruses is to never opening an unknown e-mail.

IV. Who is a hacker? What can a hacker do?

Ans. **Hacker:** Hacker is a person who indulge himself in computer hacking activities. Hacker is a computer expert who uses his expertise for malicious purposes.

Hacker can do: Hacker Steals

1. Client or customer information
2. Credit card details and social security numbers, for identity fraud or theft
3. Passwords
4. E-mail addresses, which may be used for spamming.

V. How Adware affect the working of a Computer?

Ans. Adware affects the working of a computer in such a way that it automatically plays, displays, or downloads advertisements to the computer without user's knowledge.

VI. Name the different types of viruses.

Ans. Examples of Viruses are: NYB, AntiExe, Cascade, FRODO, Win95 and Zmist A, etc.

VII. What is an Antivirus?

Ans. Antivirus is a computer program that detects, prevents and takes action to deactivate or remove malicious programs. Antivirus software protect computer connected to the networked computers.

Q5. Give detailed answers to the following questions.

I. Explain different threats to the security of a computer.

Ans. Different threats to the security of a computer: Following are the different threats to the security of a computer.

1. Virus: A computer virus is a program written intentionally to alter the way a computer operates, without the permission or knowledge of the user. A virus replicates and executes itself by attaching the copies to other files such as program files or documents. When activated a virus may:
  - (i) Damage or delete files
  - (ii) Erase data in hard disk
  - (iii) Cause erratic system behaviour
  - (iv) Display annoying messages, etc.

Examples of Viruses are: NYB, AntiExe, Cascade, FRODO, Win95 and Zmist A, etc.

2. Worms: Worms are malicious programs that replicate and spread independently and harm the computer.
- Worms spread through:
  - I. Network
  - II. Internet
  - III. Copying itself from disk to disk or by e-mail.

SQL Slammer, The Blaster Worm, Sasser worms, Melissa and LOVEYOU are examples of computer worms.

Computer worms can:

- (a) Destroy files in the system
  - (b) Slow down the computer
  - (c) Cause some programs to stop working
3. Adware: Adware is a software which automatically plays, displays, or downloads advertisements to a computer usually without user's knowledge. These advertisements can be in the form of a pop-up. They record user's behaviour on the internet, display ads and can even download other malicious software on to the computer.

4. Hackers: People who include themselves in computer hacking activities are called Hackers. Hackers are computer experts who use their expertise for malicious purposes.

- (i) Client or customer information
- (ii) Credit card details and social security numbers, for identity fraud or theft
- (iii) Passwords
- (iv) E-mail addresses, which may be used for spamming.

ii. Explain various ways through which security threats spread in computers.

Ans. Ways through which security threat spread: There are different ways through which security threats spread which are:

1. Infected flash drives or disks: Flash drives and disks are the main source of spreading viruses among computers. Once an infected flash drive or a disk is connected to a healthy computer, it becomes infected with viruses.
2. E-mail Attachments: An e-mail virus is a computer code sent as an e-mail attachment. If activated, it may cause some harmful effect, such as destroying certain files on the hard disk and causing the attachment to be forwarded to everyone in the address book. These viruses require the user on double-clicking on the attachment containing viruses. This causes the malicious code to mail itself to other people from that computer. The best defense against e-mail viruses is to never opening an unknown e-mail.

3. Surfing Insecure websites: An insecure website engages in questionable or unethical practices and attempt to:

- (a) Automatically access the computer when users visit them.
- (b) Install Adware that may cause a flurry of pop ups to appear on the screen.

4. Installing Pirated Software: Pirated software may be faulty or loaded with malware and may contain viruses. Pirated software can threaten the safety of computer users. These software products may be used to steal personal information, load a computer with viruses, or engage in activities which can harm the computer.

iii. Give the steps to update the virus definition of antivirus software.

Ans. Steps to update the virus definition: There are different steps to update the virus definitions like:

1. By turning on the option of Auto-Update feature of the antivirus.
2. By downloading and installing the virus update definitions files.

iv. What is meant by scanning computer and what are the steps to scan a computer?

Ans. Scanning computer: Scanning the computer for threats like viruses, worms, adware, etc. is very important to keep a computer system in good working condition. It helps to protect a computer from different computer security threats.

Steps to scan computer: Different steps are followed to scan computer via different antivirus programs. If AVG antivirus is installed in the computer then these steps are used to scan the computer.

Follow these steps to scan the computer using AVG antivirus software. Run AVG antivirus software using the following steps.

- (a) Click Start -> Programs -> AVG Free Edition -> AVG Antivirus Free Edition for Windows.
- (b) Click "Update Manager" for updates. Always check for updates before scanning computer. Once you start the update, AVG will first verify

whether there are new update files available. If so, AVG starts their downloading and launches the update process itself. Once it finishes downloading the update, it will install it, and may restart AVG free Edition.

- (c) Click "Scan now". It will then start scanning the computer for infected files. This will take some time.
- (d) The "Whole computer scan" option can be launched directly from the scanning interfaced by clicking on it. The scanning will start.
- (e) If viruses are detected, they will be automatically removed or sent to the "Virus Vault".

v. What is meant by virus definitions / updates? Why they are important? Explain.

Ans: Virus Definitions contain the information about malware which can be used to identify security threats. While scanning a computer, Virus definitions tell the antivirus software to recognize viruses. When antivirus software is installed a file containing a set of virus definitions file is also installed.

To protect the computer from the most current viruses, user must update antivirus software regularly. Most antivirus programs include an Auto-Update feature that enables the antivirus program to download profiles of new viruses so that it can check for the new viruses as soon as they are discovered.

An Antivirus Update is a up-gradation of already installed antivirus software. Update virus definitions can protect and clean the computer from the most recent computer viruses and other security threats.

**Lab Activities**

Lab Activity 1: Note which computer antivirus program is installed in computers

of your school computer Lab.

Instructions: When you will observe the computers of your school computer LAB for antiviruses, you will find out one of the following antivirus in computer.

1. Symantec
2. AVG
3. McAfee
4. Avast
5. Eset Smart Security
6. NOD 32

Lab Activity 2: Run antivirus program and see if the virus definition file is up-to-date or not.

Instructions: By running antivirus program, you can check it from the update option of the antivirus program.

Lab Activity 3: Run manual virus definition update feature and update If new virus definitions are available.

Instruction: By running manual virus definition update feature, you can download and install new virus definitions are available or not.

Lab Activity 4: Scan your computer with antivirus and note what different viruses are detected.

Instructions: Scan your computer with antivirus, you will note some viruses (if computer will detect) given below:

1. New Folder.exe
2. NYB
3. Zmist A
4. AntiExe
5. Cascade etc.

Lab Activity: 5. Attach a USB Flash Drive and scan it for viruses.

Instructions: Attach a USB Flash Drive with computer. Click on "My Computer", then right click on the USB flash drive and select the option of scanning OR you can select the custom scanning option in the antivirus program and select the USB flash drive for scanning.

**OBJECTIVE AND SUBJECTIVE**  
According to new examination system

**MULTIPLE CHOICE QUESTIONS**

- When virus attacks on computer that computer demands:
  - (a) Formatting (b) Rebooting
  - (c) Upgrading (d) Modifying
- A program that replicate itself is:
  - (a) Bug (b) Worm (c) Vaccine (d) Bomb
- The software used to prevent, detect and remove worms Trojan horses is known as:
  - (a) Virus software (b) Antivirus software
  - (c) Operating system (d) System software
- Hiba's computer is infected by a virus. Which software can be helpful for her?
  - (a) MS Windows (b) McAfee
  - (c) Corel Draw (d) UNIX
- A program designed to destroy or damage the computer files is called:
  - (a) Downloading (b) Scanning
  - (c) Booting (d) Virus

**OPEN ENDED QUESTIONS**

- What is Virus?  
Ans. Virus: A computer virus is a self-replicating program containing code that explicitly copies it and that can "infect" other programs by modifying them or their environment.
- Define Antivirus.  
Ans. Antivirus: Antivirus software are special programs that detect and remove viruses from the computer. Anti-virus programs not only clean viruses from infected files and disks, they can also prevent new viruses from getting to the computer.

(c) How can you protect your infected flash drives or floppy disks?

Ans. Protection of infected flash drives or floppy disks: To prevent my flash device from becoming an infection carrier.

- Click My Computer;
- Right-click on Flash Drive;
- From the menu, select Open;
- If the file autorun.inf is present in the root of flash device, delete this file;
- Create the folder named autorun.inf in the root of the flash device by right-clicking the free space and selecting Create > New Folder from the menu;
- Copy some files to the newly created autorun.inf folder;
- To make the autorun.inf folder read-only, right-click the folder name, select Properties, and check the Read-Only mark.
- Click OK.

Now, my flash device is fully protected against any kind of an autorun infection.

**UNIT 3: Spreadsheets in Excel**

**Solution of Exercise**

- Tick the correct choice for the following statements / questions.
  - Where is Microsoft Office Button located in Word window?
    - (a) Top Left (b) Top Right
    - (c) Bottom Left (d) Bottom Right
  - How many command Tabs are there in Excel 2007 window by default?
    - (a) Five (b) Six (c) Seven (d) Eight
  - In Excel, which of the following is the Intersection of a row and a column?
    - (a) Table (b) Form (c) Cell (d) Formula

iv. Which of the following is Spreadsheet software?

- (a) Word (b) Powerpoint (c) Access (d) Excel

v. Which of the following bars gives access to the frequently used commands in Excel?

- (a) Formatting toolbar (b) Status bar
- (c) Scroll bar (d) Quick Access toolbar

vi. By default, how many sheet tabs are available in Excel workbook?

- (a) Two (b) Three (c) Four (d) Five

vii. \_\_\_\_\_ are arranged vertically in an Excel worksheet.

- (a) Rows (b) Columns (c) Cells (d) Active cells

viii. What is a currently selected cell in a spreadsheet called?

- (a) Any cell (b) Active cell
- (c) First cell (d) Main cell

ix. \_\_\_\_\_ consists of the column letter and row number that intersect at the cell's location.

- (a) Cell address (b) Cell location
- (c) Selected cell (d) Active cell

x. What is the purpose of Cut-Paste command?

- (a) Moves the contents from one cell to another location (b) Copies the contents from one cell to another location
- (c) Deletes the content without copying (d) Having no effect on cell contents

xi. Fill in the blanks.

- A Spreadsheet is a computer application which displays data in multiple cells usually in a two-dimensional matrix or grid consisting of rows and columns.
- A workbook is a file created by Excel spreadsheet application.
- Worksheet is a single page in Workbook.
- Next to the Microsoft Office button is the quick access toolbar.
- Formula bar displays the contents of the active cell and the formulas as user types them

In an active cell.

vi. Name Box displays the reference of the active cell.

vii. Rows are arranged horizontally in a worksheet.

viii. Selecting more than one cell is known as cell range.

ix. Auto filling is the use of the fill-handle to copy data and sequences across a range of cells.

x. A formula is an equation that performs a calculation using values in the worksheet.

xi. Functions are pre-defined or built-in formulas.

xii. MAX function returns the largest value from a supplied set of numerical values.

xiii. When users Cut or Copy text, it gets placed on the clipboard.

xiv. Font is the typeface of text and it is a set of characters.

xv. Match Column A with Column B.

Column A	Column B
Spreadsheet	Currently used cell
Ribbon	Cell reference
Active Cell	Fill handle
Name box	Excel
Auto-filling	Command Tab
Predefined formula	Function

Q4. Give short answers to the following questions.

- Define the following terms:
  - Spreadsheet, Workbook, Worksheet, Cell, Cell address, Cell reference, Formula, Function.

Ans. Spreadsheet: Spreadsheet is a computer program used to enter, analyze, and calculate data for record keeping. It stores and present data in rows and column. Data can easily be entered, modified and deleted from it.  
Workbook: A workbook is a file created by Excel spreadsheet application.

**Worksheet:** Worksheet is a single page in workbook which is collection of cells on a single "sheet" where user keeps and manipulates the data.

**Cell:** The intersection of row and column in a worksheet is called cell. Cell is the basic unit in the worksheet where user can enter data, function or formula.

**Cell address or Cell reference:** Cell Address or Cell Reference identifies the location of a cell or group of cells in a worksheet. It consists of the column letter and row number that intersect at the cell's location.

**Formula:** A formula is an equation that performs a calculation using values in the worksheet. A formula always begins with an equals sign followed by either values of cell references and an operator.

**Function:** Functions are pre-defined or built-in formulae.

**II. Give few purposes of Spreadsheet?**

**Ans. Few purposes of spreadsheet are:**

1. Store and maintain data in a tabular form.
2. Manipulate and calculate data by using various functions and formulae.
3. Perform complex mathematical calculations.
4. Recalculate formula automatically whenever a value is changed or modified.
5. Create charts / graphs to represent data.
6. Process and display needed information by sorting and filtering entries according to established criteria.

**III. Name any five components of Excel window.**

**Ans. Office button, Title bar, Ribbon, Formula bar, Name box are the five components of Excel window.**

**IV. What is cell range? Give one example.**

**Ans. Cell Range:** Selecting more than one cell is known as a cell range. Two cell references

are used for a range of cells separated by a colon (:) which tells Excel to include all the cells between the start and end points.  
**Example:** Range of cells from C4 to F7 can be selected as:



**V. What is auto-filling data feature in Excel? Give one example.**

**Ans. Auto filling Features:** Auto filling is the use of the fill-handle to copy data and sequences across a range of cells. The fill-handle is at the right corner of each cell.

**To Fill a Range to Cells:**

1. Select the cell with the content to fill.
2. Point at the black square that appears in the bottom right corner of the cell, until the mouse pointer becomes the fill handle.
3. Click and drag in the direction of the range to fill.

Figure below shows auto filling of even numbers in Column C from 2 to 16.



**VI. How formula is used in Excel sheet? Give one example.**

**Ans. Formula:** A formula always begins with an equals sign followed by either value or cell references and operator.

**Example:** The formula of = B1+B2+B3 can be written in a function as =sum (B1:B3)

**VI. Name different parts of function with the help of an example.**

**Ans. Parts of function:** There are three parts of function:  
1. Equal Sign (=) 2. Function Name  
3. Argument



**Will. What is the difference between Copy-Paste and Cut-Paste?**

**Ans. Difference:**

Copy-Paste	Cut-Paste
The Copy-Paste option is used to take the duplicate of the selected cell contents by copying them and pasting them where required. This option does not remove the text from the source location.	The Cut-Paste or Move option is used to move text from one place (source) to another place (destination).

**IX. What is a chart? Name any three types of charts used in Excel.**

**Ans. Chart** is the graphical representation of data entered in a worksheet. Charts are helpful in showing the comparison between different categories. Three types of charts are used in excel which are: Column chart, Line chart, Pie chart.

**Q5. Give detailed answers to the following questions.**

**I. Explain different parts of Excel window.**

**Ans. Parts of Excel Window:** The Excel 2007 window has several parts which are:

**Office Button:** The Office Button is at the top left of the Excel window. Clicking this button

opens a menu of commands.

Recent documents can be seen on the right of the Office Button menu.

**Quick Access Toolbar:** It is located at the top of the Excel window. On the Title bar, Microsoft Excel displays the name of the workbook currently used.

On the right side of Title bar are three control buttons: Minimize, Restore or Maximize, and Close buttons to control the window.

**Title Bar:** Next to the Microsoft Office Button is the Quick Access Toolbar. The Quick Access Toolbar gives access to frequently used commands. By default, Save, Undo, and Redo appear on the Quick Access Toolbar.

**Ribbon:** The Ribbon is located below the Quick Access toolbar. The commands on the Ribbon are organized in seven tabs and each tab is divided into groups which have buttons of related commands.

**Formula Bar:** Formula bar displays the contents of the active cell and the formulae as user types them in an active cell. The formula bar can be used to edit cells content easily. The formula bar also contains the Insert Function button used to guide the user through the creation of mathematical formulae.

**Name Box:** Name Box displays the reference of the active cell. It is located next to the formula bar.

It can also be used to go to a specific cell by entering the name of the cell in it.

**Document (Worksheet) Window:** The document (worksheet) window contains an Excel workbook that consists of a number of worksheets. A worksheet is a document window where user can enter data and modify it. The worksheet is made up of rows and columns. Intersection of a row and a column is called a cell. The name of the cell is made up of the column name and the row name, for example A1 is the cell in column A and row 1.

At the bottom of each worksheet is a numbered sheet tabs. It has the name of the worksheet on it, which can be changed. Sheet tab can be used to bring the worksheet to the front.

**Sheet Tabs:** Sheet tabs are used to access different worksheets in a workbook. By default, three sheet tabs are available in a workbook. User can add more tabs as required by using mouse right click menu and selecting the 'Insert' option followed by 'Worksheet' option. User can also change the tabs name to easily identify the data entered in the sheet using right click menu.

**II. What is purpose of the following functions? Give one example of each.**

**SUM, PRODUCT, AVERAGE, POWER, SQRT, MAX, MIN**

**Ans. SUM Function:** The function of SUM function is to add all the numbers that user specifies as arguments. Each argument can be a range, a cell reference, an array, a constant, a formula, or the result from another function.  
**Example = SUM(B5:B9)** adds all the number that are contained in cells B5 through B9.

**PRODUCT Function:** The function of PRODUCT function is to multiply all the number given as arguments and returns the product.  
**Example:** In cell A4, the function =PRODUCT(A1, A2) is used to multiply two numbers in cells A1 and A2.

**AVERAGE Function:** The function of AVERAGE function is to return the average (arithmetic mean) of the arguments.  
**Example:** If the range B1:B5 contains numbers, the formula =AVERAGE(B1:B5) returns the average of those numbers.

**POWER Function:** The function of POWER function is to return the result of a number raised to a power. Its general form is:  
 =POWER (number, power)

Number is the base number. It can be any real number.

Power is the exponent to which the base number is raised.

**Example:** The function =POWER(55,3) is used to find the value for 55 raised to the power 3.

**SQRT Function:** The function of SQRT function is to calculate the square root of a given number. Its general form is:  
 SQRT (number)

Number is the number for which the square root is needed.

**Example:** The function =SQRT(256), finds the square root value of the number.

**MAX Function:** The function of MAX function is to return the largest value from a supplied set of numerical values. Its general form is:  
 =MAX(number1, [number2]...)

Where, the number arguments are a set of one or more numeric values to return the largest value of them.

**Example:** The function =MAX(A1:E1) in cell B3 return the maximum value.

**MIN Function:** The function of MIN function is to return the smallest value from a supplied set of numerical values. The general form of the function is:  
 =MIN (number1, [number2]...)

**Example:** The function =MIN(A1:E1) in cell B3 return the minimum value.

**III. What is text formatting? Give procedure to change font and font size in Excel.**

**Ans. Text formatting:** Text formatting includes formatting the font size, style, and color, and using the Bold, Italic, Underline, and aligning of the cells.

**Procedure to change font:**  
 Select cells to change the Font.

(a) Choose the Home tab.

(b) Click the down arrow next to the Font box. A list of fonts appears.

(c) Find and click the required font from the list.  
**Procedure to change font size:**  
 (a) Select cell or cells to change the size.  
 (b) Choose the Home tab.

Click the down arrow next to the Font Size box. A list of font sizes appears.

(d) Click on the required size.

**W. What is a border? Give procedure to apply a border to a selected range in Excel.**

**Ans. Border:** Borders are outlines around the cell or cells. User can use borders to make entries in worksheet stand out.  
**Procedure to apply Borders to a selected range:**

(a) Select cell or cells to apply borders.

(b) Click the down arrow next to the Borders button a menu appears.

(c) Click the required border option.  
 (d) Excel applies the selected border to the selected cells.

**V. Give procedure to insert new rows and columns in Excel.**

**Ans. Users can insert new rows and columns as required**

**To insert a new column:**

(a) Click on the column before which a new column is required to be inserted.

(b) Click the down arrow next to Insert in the Cells group. A menu appears.

(c) Click Insert Sheet Columns. Excel inserts a new column.

(d) Click anywhere on the worksheet to remove your selection.

**To insert a new row:**

(a) Click on the row above which a new row is required to be inserted.  
 (b) Click the down arrow next to Insert in the Cells group.

LAB ACTIVITIES

Activity 1: Create the following sheet in Excel:

	A	B	C
1	Length	Width	Area
2	12	10	
3	14	23	
4	16	15	
5	17	16	
6	15	21	

Enter the formula to calculate the area of rectangle in cell C2 and copy the formula from cells C3 to C6 by dragging the fill-handle downwards.

Hint: Area of Rectangle = Length x Width

Method:

	A	B	C
1	Length	Width	Area
2	12	10	=12*10
3	14	23	
4	16	15	
5	17	16	
6	15	21	

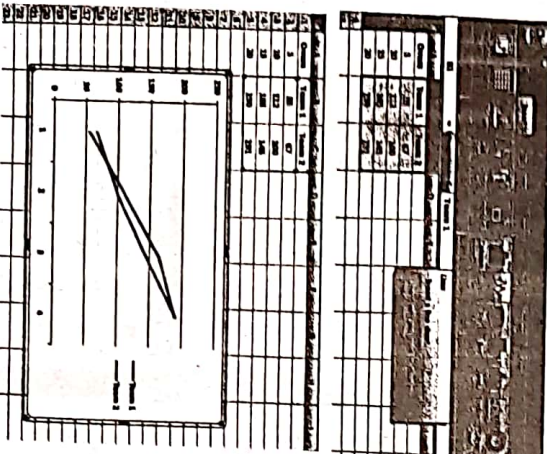


Activit 2: Create the following worksheet, centralize the data and draw the line graph for the given data.

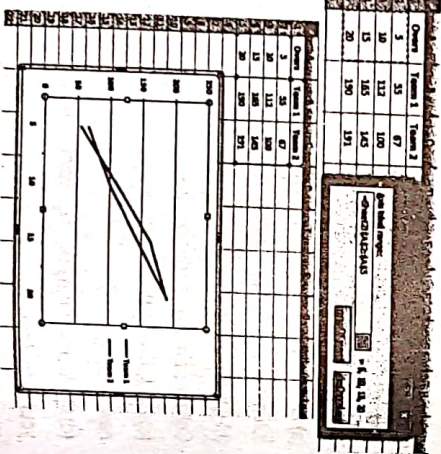
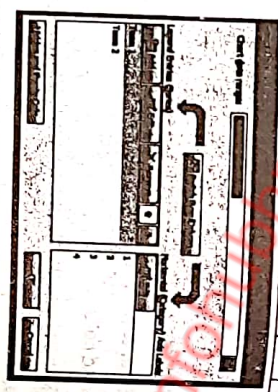
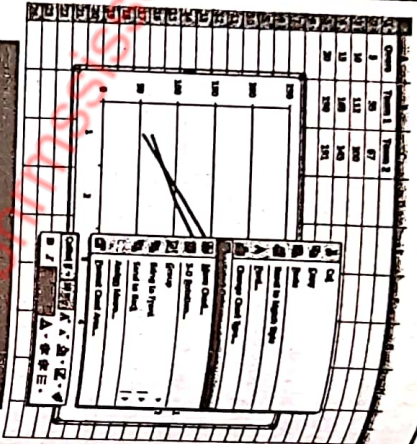
	A	B	C
1	Overs	Team 1	Team 2
2	5	55	67
3	10	112	100
4	15	165	145
5	20	190	191

Method:

	Team 1	Team 2
1	5	67
2	112	100
3	165	145
4	190	191



weight and total age of your friends.  
 c. Apply the appropriate function to find the average weight and average age.  
 d. Apply the MAX function to find the maximum weight and maximum age.  
 e. Create bar chart to show the weights and ages.



Activity 3: Create a worksheet to enter the following data for your 10 friends.  
 Names Age Weight  
 a. Enter data in the worksheet.  
 b. Apply SUM function to find the total

Names	Age	Weight



Activity 4: Create the following spreadsheet which shows the destination of people who travelled in Blue-lines Taxis during one week.

	A	B	C	D	E	F
1	School	Shops	Stations	Others	Total	
2	Mon	5	4	7	4	
3	Tue	8	8	3	6	
4	Wed	2	6	7	2	
5	Thur	3	9	8	6	
6	Fri	6	4	7	7	
7	Sat	7	7	6	5	
8	Sun	0	6	9	8	
9	Total	31	44	47	38	
10	%Age					

a. Give formula to find the total in Cell F2.

b. Select the range of cells from F3 to F9 and copy the formula from cell F2 in it.  
 c. Give a formula in B10 to calculate the percentage and copy it from cells C10 to F10.  
 d. Create a labeled pie chart showing the number of people travelling to the station that week.  
 Ans.

Activity 5: The City Government is developing a website to inform the general public about the weather. A spreadsheet was produced to show some of the statistical data.

	A	B	C	D	E	F	G
1		Jan	Feb	Mar	Apr	May	Jun
2	Monthly Rainfall (mm)	130	210	340	350	220	170
3	Hours Sunshine (per day)	7	6	6	6	9	10
4	Minimum Temperature (°C)	3	8	12	18	24	30
5	Maximum Temperature (°C)	12	18	23	29	38	48

	H	I	J	K	L	M	N
Jul	Aug	Sep	Oct	Nov	Dec	Averages	
100	30	26	20	10	50	138	
10	6	9	9	10	8	8	
28	25	23	20	15	10	18	
46	41	40	35	30	20	32	

- What formula is used in N2 to show the average (mean) rainfall?
- Insert a line chart to show Hours Sunshine and Monthly Rainfall for the whole year.

Ans.

Activity 6: Create the following spreadsheet to show the result of six students.

A	B	C	D
1	Name	Total Marks	Percentage Marks
2	All	800	650
3	Mona	800	700
4	Hassan	800	456
5	Fatima	800	544
6	Waheed	800	329

Apply the following formatting on the sheet:

- Make Row 1 as bold and centralize it.
- Change font size of Column 1 and Row 1 to 18 points.
- Change the front of the numeric data to Arial black.
- Select the range from B2 to D6 and apply a border.
- Change the background colour of Row 1 and Column 1 to yellow.

Name	Total Marks	Obtaining marks	Percentage Marks
All	800	650	81.25
Mona	800	700	87.5
Hassan	800	456	57
Fatima	800	544	68
Waheed	800	329	41.13

**OBJECTIVE AND SUBJECTIVE**  
According to new examination system

**MULTIPLE CHOICE QUESTIONS**

- An electronic sheet of cells which can contain data and formula is:
  - Spreadsheet
  - Worksheet
  - Slide
  - Report
- A software which allows to enter, calculate manipulate and analyze set of numbers is:
  - MS Word
  - MS PowerPoint
  - MS Excel
  - MS Project
- Chart is linked to data of:
  - Worksheet
  - Font size
  - Alignment
  - Shading
- In MS Excel, during entering data in a cell data appears in:
  - Cell's name box
  - Formula bar
  - Title bar
  - Menu bar
- The arithmetic mean of a list in MS Excel can be obtained by:
  - Product formula
  - Total formula
  - Average formula
  - Sum formula

**OPEN ENDED QUESTIONS**

1(a). Why do we use Microsoft Excel?

Ans. Usage of Microsoft Excel: There are many usage of Microsoft Excel. A few of them are as follows:

- It is used for 'Sales and Cost Analysis'.
- It is very easy to create 'Financial Reports' in it.
- It is used for 'Sales Forecasting'.
- The accountants use it for 'Stock/Inventory Control'.

(b) Describe the Name Box and Formula bar.  
Ans. Name Box: It displays the reference of active cell. It is located next to the formula bar. It is also used to go to a specific cell by entering the name of the cell in it.

Formula Bar: This bar display the contents of the active cell and the formulae as user types them in an active cell. The formula bar can be used to edit cell content easily.

(c) Define cell:

Ans. Cell: The intersection of row and column in a worksheet is called cell. Cell is the basic unit in the worksheet where user can enter data, function or formula. Every cell has its unique cell address or cell reference.

**UNIT 4: Problem Solving**

**Solution of Exercise**

Q1. Tick the correct choice for the following questions.

- How many elements a problem has?
  - 1
  - 2
  - 3
  - 4
- What is the solution to a problem called?
  - Problem Solving
  - Problem Statement
  - Identifying Problem
  - Ignoring Problem
- A \_\_\_\_\_ is an obstacle, hurdle, difficulty or challenge, or any situation that needs to be removed or solved.
  - Answer
  - Solution
  - Situation
  - Problem

iv. What is the name of the problem statement element that we give to the computer as raw material to solve the problem?

- Input
- Output
- Process
- Ideas

v. \_\_\_\_\_ is the result which is obtained by processing the input data.

- Input
- Output
- Process
- Algorithm

vi. Which symbol is used to show decision process in the flowchart?

- Oval
- Rectangle
- Diamond
- Parallelogram

vii. In flowchart which symbol uses only one flow line?

- Terminal
- Processing
- Decision
- Input

viii. Which symbol is used to represent a process in the flowchart?

- Oval
- Rectangle
- Diamond
- Parallelogram

Q2. Fill in the blanks.

- Problem solving techniques are helpful in solving problems.
- A problem statement is a concise description of the problem to be solve.

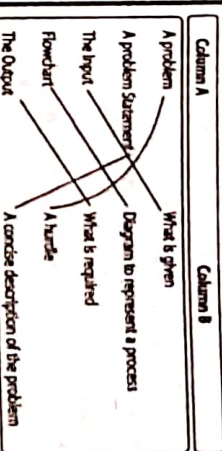
iii. The processing requirements involves performing actions or operations on input data to achieve the desired goals and find the solution to the problem.

iv. Flowchart is a process of pictorial illustration for solving a problem.

v. The input / output in a flowchart is represented by a parallelogram shape.

Q3. Match Column A with Column B.

Ans:



Q4. Give brief answers to the following questions.

i. What are the key features of a problem statement?  
Ans. The key features of a problem statements are:

- Clarity and precision
- Identification of what would be studied
- Identification of key factors or variables
- Identification of key concepts and terms

ii. What is flowchart?

Ans. A flowchart is a type of diagram that represents a process, showing the steps as symbols of various kinds, and their order by connecting them with arrows. This diagrammatic representation can give a step-by-step solution to a given problem.

iii. What are the uses of flowchart?

Ans. The uses of flowchart are:  
(a) It is used for analyzing processes.  
(b) It is used in computer systems design and programming.

(c) It is also used in engineering and science.

iv. What are the advantages of drawing flowchart?

Ans. The following are the advantages of drawing flowcharts:  
(a) It helps in understanding the logic of the problem solving processes.  
(b) It gives the pictorial representation of the processes involved in the problem solution.

(c) It shows the flow processes in a sequential manner.

v. What is the use of decision symbol?

Ans. Decision Symbol: Diamond symbol is used to show decision process in a flowchart.

Q5. Give detailed answers to the following questions.

1. Explain the elements of a problem statement.

Ans. Elements of a Problem Statement  
A problem statement has the following three elements:

- (a) What is given - the Input
- (b) The Processing requirements
- (c) What is required - the Output

1. What is given - the Input: Input is such element of the problem statement that we give to the computer as raw material to solve the problem. It can be extracted from the present situation of the problem statement.

Example:

Problem: Preparing Tea

The input material for preparing tea would be an Electric Kettle, Water, Tea bag, Milk and Sugar.

2. The Processing Requirement

This involves performing actions or operations on input data to achieve the desired goals and find the solution to the problem.

In Problem the processing requirements are:

- ☆ Boiling water by plugging in the Kettle.
- ☆ Adding sugar, Tea bag and Milk.

3. What is required - the Output

Output is the result which is obtained by processing the input data. It is also called the solution. It is the change or improvement in the situation or behaviour and the target or goal, one is aiming for the problem solution.

In Problem the output required is "The prepared tea, served in a cup".

ii. What is flowcharting? How flowcharts help in problem solving?

Ans. Flowcharting is a process of pictorial illustration for solving a problem. Flowcharting is a tool for analyzing processes.

Flowcharts can be helpful in computer systems design, programming, engineering, and science, etc.

Flowchart helps in finding the solution of a problem and facilitate in showing the input,

process and output of the problem.

iii. Explain different symbols used to draw flowcharts with examples.

Ans. Flowchart Symbols: Flowcharting use standardized sets of symbols. Flowchart Symbols with their description and examples are given in the following table.

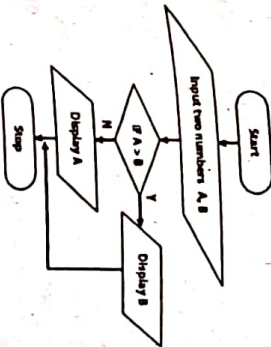
Description	Symbol	Examples
<b>Start / End symbol</b> An oval shape symbol that represents the Start or End of a flowchart.		Start End
<b>Input / Output Symbol</b> The input / output in a flowchart is represented by a parallelogram shape.		Input A, B Read Name, Age, Class
<b>Processing Symbol</b> Rectangle shape symbol is used to represent the process or action taken.		Sum = A + B X = 15
<b>Flow Lines</b> Arrow head with line is used to show the flow of any process in a flowchart. These symbols show the flow of data, information or process in the flowchart.		Start End
<b>Decision Symbol</b> Diamond symbol is used to show decision process in a flowchart.		X > 15 C < 10

Lab Activities

Draw flowcharts for the following problems:

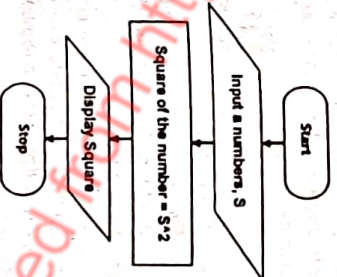
i. To find the smallest of the two given unequal numbers.

Ans.



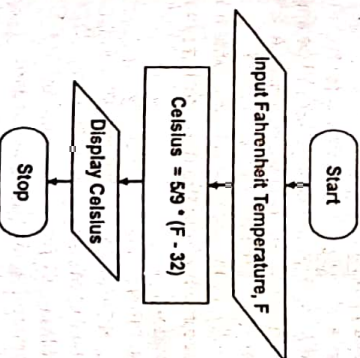
ii. To find the square of a given number.

Ans.



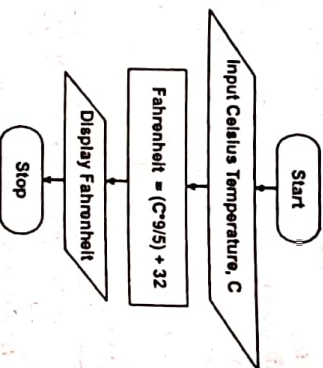
iii. To convert the Fahrenheit temperature into Celsius temperature.

Ans.



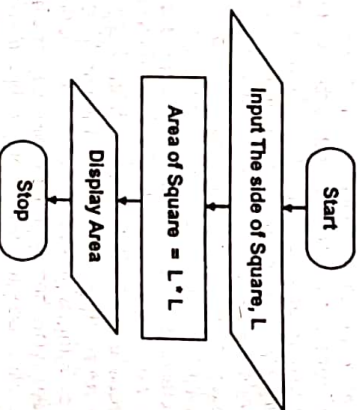
iv. To convert the Celsius temperature into Fahrenheit temperature.

Fahrenheit temperature.



v. To find the area of a square region with given side.

Ans.



**OBJECTIVE AND SUBJECTIVE**  
According to new examination system

**MULTIPLE CHOICE QUESTIONS**

1. Converting Input into expected output is called:

- (a) Designing
- (b) Answering
- (c) Processing
- (d) Output

2. Dividing a big problem into smaller problem is called:

- (a) Problem Solving
- (b) Problem dividing
- (c) Problem testing
- (d) Problem making

3. A flow chart always starts with:

- (a) Terminal symbol
- (b) Processing symbol

- (c) Decision symbol (d) Input/output symbol  
 4. In flow chart an oval shape symbol is used for:  
 (a) Start/End (b) Processing  
 (c) Input/Output (d) Flow  
 5. The Input, output and the procedure define the:  
 (a) Flow chart (b) Algorithm  
 (c) Problem (d) Coding

**OPEN ENDED QUESTIONS**

1(a). Why flowchart is important for writing computer program?  
 Ans. A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting these with arrows. This diagrammatic representation can give a step-by-step solution to a given problem. Process operators are represented in these boxes, and arrows connecting them represent flow of control. Data flows are not typically represented in a flowchart, in contrast with data flow diagrams; rather, they are implied by the sequencing of operations. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields. Flowchart is designed because it is easier to follow the structure in a picture than in words. The basic purpose of flowcharts is to clarify the flow of data from one programme component or operation to another one in a standardized form.  
 (b) Define Flow Charts.  
 Ans. Flowchart: Flowchart is a pictorial representation of an algorithm. It is also a graphical representation of the flow of data.  
 (c) Define the Flow Lines and Terminals.  
 Ans. Flow line: The line with an arrow head gives the directions of flow of logic, and show the direction of data  
 Terminal: An oval shape symbol is used to represent the points where the program begins or end.



**UNIT 5: Computer Programming**

**Solution of Exercise**

- Q1. Tick the correct choice for the following questions.  
 I. A sequence of instructions given to the computer to perform a specific task is called:  
 (a) Data (b) Program  
 (c) Programming (d) Information  
 II. What is a named space in the computer's memory whose value can be changed during the execution of program?  
 (a) Variable (b) Constant (c) Program (d) Data  
 III. In BASIC programming language which character is used as a last character with string variable?  
 (a) ? (b) & (c) % (d) \$  
 IV. Which shortcut key is used to apply RUN command in GWBASIC?  
 (a) F1 (b) F2 (c) F3 (d) F4  
 V. Which of the following error cannot be detected by a computer?  
 (a) Syntax error (b) Run time error  
 (c) Logical error (d) Execution error  
 VI. Which of the following is a logical operator?  
 (a) + (b) - (c) ^ (d) /  
 VII. Which of the following operator has the highest priority?  
 (a) + (b) ^ (c) - (d) \*  
 VIII. If A=5, B=3 and C=2, what will be answer of the following expression? Exp = A+B\*C  
 (a) 10 (b) 11 (c) 13 (d) 16  
 IX. Which of the following statements is used to accept data from the user during program execution?  
 (a) PRINT (b) LOAD  
 (c) READ-DATA (d) INPUT  
 X. The set of rules that define the combination of symbols used by programming languages is called:  
 (a) Syntax (b) Data  
 (c) Program (d) Logic

- Q2. Fill in the blanks.  
 I. Programming languages are the means of communication between users and the computer.  
 II. Constants are the quantities whose values cannot be changed during program execution or running.  
 III. In a program the occurrence of incorrect or unexpected result is called an error.  
 IV. A logical error is an error resulting in wrong answer due to programmers own mistake.  
 V. Operators are symbols that represent particular actions in programming languages.  
 VI. An operator which is used to assign a Value to a variable is called assignment operator.  
 VII. BASIC stands for Beginner's All Purpose Symbolic Instruction Code.  
 VIII. In BASIC language, program line number is a positive integer.  
 IX. Commands are key words which are used to issue instructions to the computer to perform specific tasks.  
 X. In GWBASIC, CLS command is used to clear to screen.

- Q3. Match the columns A with Column B.  
 Ans:
- | Column A            | Column B                  |
|---------------------|---------------------------|
| Constants           | MOD                       |
| Variables           | READ-DATA                 |
| Arithmetic Operator | SAVE                      |
| Relational Operator | Changeable Quantities     |
| Command             | <>                        |
| Statement           | Not Changeable Quantities |

Q4. Give brief answers to the following questions.  
 I. What is a program? Give few examples of programs.  
 Ans. Program: A computer program is a sequence of instructions given to the computer to perform a specific task. Programs are written in languages called computer languages or programming languages.  
 Examples: Examples of programs are:  
 1. A program to find area of a circle for given radius. 2. A program to solve a quadratic equation. 3. A program to control financial matters of a company.  
 II. What is the purpose of a programming language?  
 Ans. Purpose of programming language: The purpose of programming language is, it is designed to develop programs or instructions to communicate with the computer to solve various problems.

- III. Differentiate between a constant and a variable.  
 Ans. Difference:  

Constants	Variables
These are the quantities whose values cannot be changed during program execution or running.	These are the quantities whose values can be changed during program execution or running.

 IV. Differentiate between Syntax error and logical error.  
 Ans. Difference:  

Syntax Error	Logical Error
1. This error occurs when the instructions are not written according to the rules of programming language.	1. This error occurs due to programmers own logical mistake by using wrong formula or providing wrong value to a variable.
2. These are easy to find and correct.	2. These are hard to find and correct.
3. Computer can find out this type of error.	3. Computer cannot find this type of error.

 V. What are the rules for defining / declaring variables in GWBASIC?  
 Ans. In GW-BASIC, certain rules are followed to declare / define a variable name. These are:  
 1. Alphabet and numbers can be used for variables.  
 2. The first character of the variable should be an alphabet.  
 VI. Name different types of constants with example.  
 Ans. Types of constants: There are two types of constants which are as follow:  
 1. String Constants: These are sequence of alphabetic or alphanumeric characters enclosed in double quotation marks. For example "Male", "Married", "Harris", "Pakistan" and "H.No.107", etc.  
 2. Numeric Constants: These are the numbers, for example 117, 20.50, -50 etc.  
 VII. Give the precedence of arithmetic operators?  
 Ans. Precedence is the priority that is followed while applying these operators. This becomes important when more than one kind of arithmetic operators appears within one expression.

Priority Level	Operator	Symbol
First	Exponentiation Operator	^
Second	Multiplication or division Operator	* or /
Third	Add Operator	MOD
Fourth	Addition or Subtraction Operator	+ or -

Same priority

In an expression the operators within parentheses ( ) are resolved first.

- 1. What is purpose of modulus operator (MOD)?
- Ans. The purpose of modulus operator (MOD) is to give the remainder after division.
- Example: 35 MOD 6, X MOD Y
- 2. What is the purpose of the following GWBASIC commands?

- a. LIST
- Ans. LIST command shows the list of all or part of a loaded program on the screen. F1 key is used as a shortcut key for LIST command.
- b. RUN
- Ans. RUN command is used to execute (get) result of the program. F2 key is used as a shortcut key for RUN command.
- c. LOAD
- Ans. LOAD command is used to load (open) a file from any storage medium like Hard Disk into the main memory of the computer. F3 key is used as a shortcut key for LOAD command.
- d. SAVE
- Ans. SAVE command is used to save the program in the Hard Disk or any other storage media. F4 key is used as a shortcut key for SAVE command.
- e. GIVE
- Ans. GIVE command is used to give the program in the Hard Disk or any other storage media. F5 key is used as a shortcut key for GIVE command.

- 3. Explain different types of errors in programming with examples.
- Ans. Syntax Error
- A syntax error occurs when the instructions written in a program do not follow the rules of the programming language. Syntax errors are easy to find and correct because the computer finds them for the user.
- Examples: 1. PRINT instead of PRINT
- 2. 5=X instead of X=5
- Logical Error
- A logical error is an error resulting in wrong answer due to programmers own logical mistake. These errors occur due to wrong use of formulae or providing wrong value to a variable. If a programmer writes a statement that is logically incorrect, the computer will understand and execute it but the result will be wrong.
- Example: If a programmer accidentally multiplies two variables when he or she meant to divide them, the program will give an incorrect result, but no error message. Such errors cannot be detected by computer therefore they are hard to find and correct.
- ii. What is arithmetic expression? Explain different types of operators with examples.
- Ans. Arithmetic Expression: An expression which represents a numeric value is called an Arithmetic Expression. An Arithmetic Expression is evaluated by performing a sequence of arithmetic operations to obtain a numeric value.
- Exp 1 = (A+3)\*C+2
- Exp 2 = 2\*X+3\*Y
- Types of operations:

There are three common types of operation, which are given below:

Arithmetic Operators	Mathematical calculation like addition, subtraction, division, multiplication and exponentiation. The following table gives the description of arithmetic operators with examples		
+	Addition	Gives the sum of values	A+B=C, X+50, 87+4
-	Subtraction	Gives the difference of values	X-50, A-C, 80-5
*	Multiplication	Gives the product of values	A*B, Y*50, 45*80
/	Division	Gives the quotient	X/Y, 81/40, 123/2
^	Exponentiation	Raise the value to the power of an exponent	A^10, 5^2, A^B
MOD	Modulus	Gives the remainder after division	35 MOD 8, X MOD Y

2. Assignment Operator

An operator which is used to assign a value to a variable is called Assignment Operator. In programming languages "Equal sign" (=) is used as an assignment operator.

Example: A=5

In the above example, 5 is assigned to the variable A.

3. Relational Operators

Relational Operators are used to perform comparisons on two values.

Operator/Operation Symbol	Description	Example	
=	Equal to	Returns true if the two values are equal, and false if not.	A = B
<>	Not Equal to	Returns true if the two values are not equal, and false if they are equal.	5 <> 7
>	Greater than	Returns true if the first number is greater than the second, and false if not.	15 > 11
<	Less than	Returns true if the first number is less than the second, and false if not.	7 < 9
>=	Greater than or Equal to	Returns true if the first number is greater than or equal to the second, and false if not.	(X+1) >= 7
<=	Less than or Equal to	Returns true if the first number is less than or equal to the second, and false if not.	Y <= 5

iii. Convert the following algebraic expressions into computer expressions.

a. (AB) + (BC)

Ans. (A \* B) + (B \* C)

- 6^X - 7^Y
- Ans. 6 \* X - 7 \* Y
- A + B \* C
- Ans. A + B \* C
- B2 - 4 \* A \* C
- Ans. B \* 2 - 4 \* A \* C
- XY + (X - Y)
- Ans. X \* Y + (X - Y)
- Find solution for the following expressions. If A=3, B=4 and C=5
- a. C - A \* B - 5
- Ans. = 5 - 3 \* 4 - 5 = -12
- b. (A + B) - C \* 2
- Ans. = (3 + 4) - 5 \* 2 = -18
- c. (B + C) / A \* 10
- Ans. = (4 + 5) / 3 \* 10 = 30
- d. A \* 2 + B \* 2 - 2 \* A \* B
- Ans. = 3 \* 2 + 4 \* 2 - 2 \* 3 \* 4 = 9 + 8 - 24 = -7
- e. C MOD A \* B + C
- Ans. = 5 MOD 3 \* 4 + 5 = 2 \* 4 + 5 = 8 + 5 = 13

4. Explain the purpose of the following BASIC statements with their syntax and examples.

a. PRINT

Ans. PRINT Statement: The PRINT statement is used to display message or output to the screen. As shortcut "P" can be used for PRINT command.

Syntaxes of PRINT statement are:

Syntax1: Line Number PRINT "Sequence of characters / String"

Example: 10 PRINT "I Love Pakistan"

Syntax 2: Line Number PRINT "Variables / Constants"

Example: 10 PRINT X, Y, Z

20 PRINT 205, -101

Syntax3: Line Number PRINT "String", Variable/Constants

Example: 10 PRINT "Sum of numbers="; SUM

b. INPUT

Ans. INPUT Statement: INPUT statement is used to take input from the user during the execution of the program.

Syntax: Line number INPUT (Sequence of characters / string.) List of variables Sequence of characters / string is used to prompt the user to enter the required value using keyboard and it is optional.

Example1: Program to find the square of a number

Program

```
10 CLS
20 INPUT "ENTER FIRST VALUE"; A
30 INPUT "ENTER 2ND VALUE"; B
```

20 INPUT X

30 PRINT "SQUARE of your Number is = " X^2

RUN

Enter Number = 5

SQUARE of Your Number is = 25

c. READ and DATA

Ans. READ and DATA statements are used when there is a need to process large number of variables with given data. READ statement defines the list of variables while DATA statement contains constant values for the variables in READ statements. Values in READ and DATA statement should be separated by commas.

Syntax: \* Line number READ List of Variables separated by commas

\* Line number DATA List of Constants separated by commas

Example: 10 READ X, Y, Z, K

20 DATA 8, 9, 13, 15

When the above program is executed, the line number 10 with the READ statement followed by the variables X, Y, Z, K will assign constant values from the DATA statement in the number 20 in the same order. A one-to-one correspondence exists in READ-DATA statements, i.e. X=8, Y=9, Z=13, K=15

If values in the DATA statements are more than the variables in the READ statement then the extra values of DATA are ignored. But if the variables in READ statement are more than the values in the DATA statement then a syntax error encounters i.e. "Out of Data".

Example: Program

```
10 CLS
20 DATA 6, 15, 23, 44
30 READ W, Y, X, Z
40 SUM1 = W+Y+X+Z
40 PRINT "Sum =", SUM1
RUN
Sum = 88
```

D. IF-THEN-ELSE

Ans. IF...THEN is a decision making statement, depending upon the decision, it takes some action or changes the order of execution. It helps the computer to check whether a relation is TRUE or FALSE.

Syntax: IF relational expression THEN statement(s)1 ELSE statement(s)2

If the relational expression is true then statement(s)1 will be executed otherwise the statement(s)2 will be executed.

Program

```
10 CLS
20 INPUT "ENTER FIRST VALUE"; A
30 INPUT "ENTER 2ND VALUE"; B
```

```

40 IF A<B THEN SMALL = A ELSE SMALL=B
50 PRINT "Smaller number ="; SMALL
RUN
ENTER FIRST VALUE 7
ENTER 2ND VALUE 3
Smaller number = 3
    
```

**Lab Activities**

1. Write a program in GWBASIC to input weight of your five friends with their names. Find average weight and produce the output.

```

Program:
10 CLS
20 INPUT "Enter your age Muzafar = ", M
30 INPUT "Enter your age Hassan = ", H
40 INPUT "Enter your age Bilal = ", B
50 INPUT "Enter your age Inam = ", I
60 INPUT "Enter your age Farhan = ", F
70 AVGWEIGHT = M + H + B + I + F
80 PRINT "Average weight of all friends is
= , AVGWEIGHT
90 END
RUN
Output: Enter your age Muzafar = 22
Enter your age Hassan = 25
Enter your age Bilal = 23
Enter your age Inam = 26
Enter your age Farhan = 29
Average weight of all friends is = 25
    
```

2. Measure the length and width of top of your desk. Write a program to input the length and the width and calculate the area of the top

```

Program:
10 CLS
20 INPUT "Enter the length of table = ", L
30 INPUT "Enter the width of table = ", W
40 Area = L * W
50 PRINT "The Area of the table = ", Area
60 END
RUN
Output:
Enter the length of table 10
Enter the width of table 7
The Area of the table = 70
    
```

3. Write a program to read five variables

using READ statement for five subjects i.e. English, Urdu, Maths, Science and Computer Education. Give data for these variables using DATA statement. Find the total of subject marks and print it.

```

Program:
10 CLS
20 READ English, Urdu, Maths, Science,
Computer Education
30 Total = English + Urdu + Maths +
Science + Computer Education
40 PRINT "Total Marks = ", Total
50 DATA 70, 75, 78, 80, 90
60 END
RUN
Output:
Total Marks = 393
    
```

4. Write a program to input two unequal numbers. Use IF-THEN-ELSE statement to find the bigger number and print it.

```

Program:
10 CLS
20 INPUT "First Number = ", X
30 INPUT "Second Number = ", Y
40 IF X > Y THEN LARGE = X ELSE
SMALL = Y
50 PRINT "LARGER Number is = ", LARGE
60 END
RUN
Output:
First Number = 5
Second Number = 3
LARGER Number is = 5
    
```

5. Write a program to input radius of a circle in variable R and find the area of it using the formula, AREA =  $\text{PIE} \cdot R^2$ , where PIE = 3.1415.

```

Program:
10 CLS
20 PIE = 3.1415 ; R = 0 ; AREA = 0
30 INPUT "Enter the Radius = ", R
40 AREA = PIE * R * R
50 PRINT "Area of Circle = ", AREA
60 END
RUN
Output: Enter the Radius = 4
Area of Circle = 50.264
    
```

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