

Fundamentals of computer

[Technology](#), [Computer](#)



entExamination Paper: Fundamentals of Computer IIBM Institute of Business Management Semester-I Examination Paper MM. 100 Fundamentals of Computer Section A: Objective Type (20 marks)

***** Multiple Choices:

1. b. 2 types 2. b. 1 or more input signals to produce output 3. d. Both (a) & (c) 4. b. Non-volatile 5. c. Direct-access storage device 6. c. Multiple object program files of any software 7. a. Are geographically distributed 8. b. Way in which the network's nodes are linked together 9. a. World wide web 10. .

General purpose electronic equipment for homes Fill in the Blanks: 1.

Multimedia applications are multimedia presentation, foreign language learning, multimedia Kiosk and ...multimedia books, e books, digital library, video games, animation films & virtual shops... 2. Computer audio deals with synthesizing, recording and ...Palying audio..... with a computer. 3. Collating sequence is ordering of symbols in an ...encoding.... standard. 4. Binary coded decimal is a ...6-Bit... Code. 5. The logic gates are interconnected to form gating or logic networks known as ...combinational..... ogic circuits. 6. ...CPU.... is the brain of a computer system. 7. The term ...software.... refers to a collection of programs. 8. Program errors are known as ...bugs..... 9. Documentation.... is the process of collecting, organizing storing and maintaining a complete historical record of programs. 10. File organization... deals with physical organization of records of a file for convenience of their storage and retrieval.

Section B: Short Questions (20 marks) 1. What is data processing? Data processing is a series of actions on input that converts the input into useful output.

In data processing, input is data and output is the useful information. It consists of three sub activities: Capturing input data, manipulating it and producing output information. People, procedure and devices are required to produce the output from the input data.

2. What is a file management system? File management system is a set of programs which help the users to organize, create, delete, update and manipulate their files. Its common features are as described below.

a. Transaction file: It stores the input data until the application uses it during next processing cycle.

b.

Master file: It contains all current data relevant to an application.

c. Output file: some applications use multiple programs. One program takes the output of another program as input; hence the former program stores the output as an output file.

d. Report file: It is a copy of report, generated by application in computer accessible form.

e. Backup file: It is a copy of file created by user or system to avoid loss of data due to corruption or deletion of original file.

3. What is a computer network? Computer network is a group of computers which are linked to each other via internet.

The computers on network can communicate with each other and can share information. Four basic services provided by internet to its users are electronic mail, file transfer protocol, telnet and use net news. The common network types are personal area networks (PANs), local area networks (LANs), metropolitan area network (MANs), campus area networks (CANs) and wide area network (WANs).

4. What is a secondary storage? The additional memory needed in all computers to overcome the limitations of primary storage (Limited capacity and Volatile) is called secondary storage. It is nonvolatile and has lower cost per bit stored. It operates generally at

slower speed than primary storage. Computer system uses it primarily to store large volume of data on permanent basis. Commonly used storage devices are hard disk, CD ROM, DVD, memory card and Pen drive. Section C: Long Questions (20 marks) 1. Explain the printing mechanism of laser printer. Mechanism of Laser Printers: Transfer of Data The very first step in laser printing is the transfer of data from a computer to the memory of the image processor of a printer. Writing Data

Now, once the data is transferred to the printer's memory, it is written to the printer's drum with the help of a laser. The drum will keep rotating and the moment it rotates past the laser, it sweeps off the printer's surface neutralizing some spots to about -100v. These spots are the areas where the toner remains stuck to the drum and further gets transferred to the paper. Inserting the Paper and Pickup Process of the Toner Once the writing process is over, you need to add papers to the printer. Keep the papers into the printer's paper tray.

The feed rollers inside the printer pull the paper inside and the registration rollers hold it till its release. As the drum keeps on rotating, the toner settles down in an area which is at a charge of about -100v and remains attached to the drum till the paper comes in. Transfer of the Toner to the Paper Now, the complete toned image is created on the drum. The moment you apply the paper to the printer, the toner transfer process starts. The transfer corona applies a charge of about +600v to the paper and when the paper passes through the drum, the toner which is at a charge of about -100v gets transferred to the paper.

Further, the paper passes through a static charge eliminator that decreases the positive charge in the paper, with the help of its negative charge. Fusing The process of fusion takes place in order to secure the printout by melting the minute plastic fragments present on the toner's surface, so as to fix them to the paper fibers. Laser printers are handy when it comes to fast, bulk and quality printing. But high prices and some health risks such as respiratory disorders due to the release of some harmful sub-micrometer particles are some of the disadvantages associated with laser printing.

However, this kind of printer still remains the first choice for most of the organizations when it comes to printing. 2. Explain the importance of system software for a computer system. System Software is a set of programs that manage the resources of a compute system. System Software is a collection of system programs that perform a variety of functions. * File Editing * Resource Accounting * I/O Management * Storage, Memory Management access management. System Software can be broadly classified into three types as: System control programs: It Controls the execution of programs, anage the storage & processing resources of the computer & perform other management & monitoring function. The most important of these programs is the operating system. Other examples are database management systems (DBMS) & communication monitors. System support programs: It provide routine service functions to the other computer programs & computer users: E. g. Utilities, libraries, performance monitors & job accounting. System development programs assists in the creation of application programs. E. g. , language translators such as BASIC interpreter & application generators.

Application Software: It performs specific tasks for the computer user. Application software is a program which program written for, or, by, a user to perform a particular job. Languages already available for microcomputers include Clout, Q & A and Savvy ret rival. The use of natural language touches on expert systems, computerized collections of the knowledge of many human experts in a given field, and artificial intelligence, independently smart computer systems – two topics that are receiving much attention and development and will continue to do so in the future. 1.

Operating System Software Storage Manager Process Manager File – System Manager I/O Control System Communication Manager 2. Standard System Software Language Processor Loaders Software Tools 3. Application Software Sort/Merge Package Payroll/Accounting Package DBMS General-purpose application software such as electronic spreadsheet has a wide variety of applications. Specific – purpose application s/w such as payroll & sales analysis is used for the application for which it is designed. Section D: Applied Theory (40 marks) 1. What is a computer virus? How does a typical virus works?

When a computer system suffers from virus infection, how it is cured? Defenition: Computer virus is a small software programs that are designed by human to spread from one computer to another and to interfere with normal computer operations. Work of Typical virus: The A computer virus is most often defined as “ a malicious code of computer programming”. What this means is that a computer virus is just another software, written with not so very noble intentions. A computer virus is designed to install, propagate

and cause damage to computer files and data without the knowledge and/or express permission of the user.

A computer virus can only survive, attack and propagate in computer memory. Computer memory is usually the RAM (and all different variations of it) and disk storage (hard, floppy and everything in between). Besides this you will not find computer viruses in your monitor, keyboard and certainly not in your own blood stream! The first step in any virus attack is always the invasion. This is when the virus actually enters the computer system from an outside source. Much of the effort in preventing a virus attack lies in understanding what these virus entry points are and how best to monitor and block out any possible intrusion.

All viruses enter the computer system through two main entry points: the disk network adapter card is most likely your computer network and/or modem card connected to the local Intranet and/or the Internet. Virus enters through the network card most likely disguised in the form of attachments in e-mails. These attachments are often program files and office documents containing macros. Besides this, certain webpages that we visit on the Internet may also contain harmful programming codes that might transfer virus or virus-like codes into our system.

To guard our systems against virus intrusion from these sources, many good anti-virus programs allows users to completely scan all files read from disk drives or downloaded from the Intranet/Internet. How do virus infections occur? The act of infection often begins with a harmless looking action such as opening a file (like a video game or a Word document) that one often gets in e-mail attachments or while accessing any disk in a disk drive. These

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actions inadvertently activate the virus lurking in these files and disks. The virus then installs itself into the computer's memory. Computer system suffering from virus infection:

After entering the computer memory, a virus often immediately sets out to multiply and spread duplicate copies of itself across the main data storage device (most often the hard disk drive). It does this by copying itself into as many files it can find on the disk drive. Later when users transfers or copies these files to their friends and colleagues, the virus gain entry into ever increasing number of systems. If the virus has found its way to this level of the user's computer, the user runs a high risk of permanent damage to data and hardware. But such a level of infection only happens to two types of users.

The first are those who do not employ any kind of anti-virus measures (or if they do, it obviously isn't doing a good job). The second are those who do have good anti-virus programs installed and running but did not bother updating their software with the latest virus data files. As a result newer viruses can actually use the anti-virus programs to infect an even greater number of files. So we can see here that having good anti-virus software isn't enough. One must constantly keep it updated (preferably on a monthly basis). If a virus were to just spread itself, users might not have much to worry about.

But the worst is yet to come. Many viruses contain what is called a payload. This is the destructive sequence that is activated on a certain trigger. The trigger may be the arrival of a particular date or an action done by the user. The effect of the payload can be anything as benign as some harmless

message appearing on screen to as frightening as the destruction of the disk drive's boot record – making it completely unusable and in most cases completely irreparable. Indeed it is the later that causes permanent lose of data and hardware and which is responsible for the virus' notorious reputation.

If a virus is capable of unleashing its payload on the user's system, this indicates a serious breach of security on part of the user. It's time for the user to learn from the experience and never let computer virus have a second chance. How do I know if my computer has been infected? After you open and run an infected program or attachment on your computer, you might not realize that you've introduced a virus until you notice something isn't quite right. Here are a few indicators that your computer might be infected: * Your computer runs more slowly than normal * Your computer stops responding or freezes often Your computer crashes and restarts every few minutes * Your computer restarts on its own and then fails to run normally * Applications on your computer don't work correctly * Disks or disk drives are inaccessible * You can't print correctly * You see unusual error messages * You see distorted menus and dialog boxes

How to Cure: Remove a virus manually: Sometimes a virus must be removed manually. This can become a technical process that you should only undertake if you have experience with the Windows registry and know how to view and delete system and program files in Windows.

First, identify the virus by name by running your antivirus program. If you don't have an antivirus program or if your program doesn't detect the virus, you might still be able to identify it by looking for clues about how it

behaves. Write down the words in any messages it displays or, if you received the virus in email, write down the subject line or name of the file attached to the message. Then search an antivirus vendor's website for references to what you wrote down to try to find the name of the virus and instructions for how to remove it. Recovery and prevention:

After the virus is removed, you might need to reinstall some software or restore lost information. Doing regular backups on your files can help you avoid data loss if your computer becomes infected again. If you haven't kept backups in the past, we recommend that you start now. 3. Write short notes on: (a) The OSI model (b) Internetworking tools (c) Distributed computing systems (a) The OSI model The Open System Interconnection, model defines a networking framework to implement protocols in seven layers. This article explains the 7 Layers of the OSI Model.

The OSI, or Open System Interconnection, model defines a networking framework to implement protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, and proceeding to the bottom layer, over the channel to the next station and back up the hierarchy. a. Application Layer This layer supports application and end-user processes. Communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data syntax are identified.

Everything at this layer is application-specific. This layer provides application services for file transfers, e-mail, and other network software services. Telnet and FTP are applications that exist entirely in the application level. Tiered application architectures are part of this layer. b. Presentation Layer
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This layer provides independence from differences in data representation (e.g., encryption) by translating from application to network format, and vice versa. The presentation layer works to transform data into the form that the application layer can accept.

This layer formats and encrypts data to be sent across a network, providing freedom from compatibility problems. It is sometimes called the syntax layer.

c. Session Layer This layer establishes, manages and terminates connections between applications. The session layer sets up, coordinates, and terminates conversations, exchanges, and dialogues between the applications at each end. It deals with session and connection coordination.

d. Transport Layer This layer provides transparent transfer of data between end systems, or hosts, and is responsible for end-to-end error recovery and flow control.

It ensures complete data transfer.

e. Network Layer This layer provides switching and routing technologies, creating logical paths, known as virtual circuits, for transmitting data from node to node. Routing and forwarding are functions of this layer, as well as addressing, internetworking, error handling, congestion control and packet sequencing.

f. Data Link Layer At this layer, data packets are encoded and decoded into bits. It furnishes transmission protocol knowledge and management and handles errors in the physical layer, flow control and frame synchronization.

The data link layer is divided into two sub layers: The Media Access Control (MAC) layer and the Logical Link Control (LLC) layer. The MAC sub layer controls how a computer on the network gains access to the data and permission to transmit it. The LLC layer controls frame synchronization, flow

control and error checking. g. Physical Layer 1 This layer conveys the bit stream - electrical impulse, light or radio signal through the network at the electrical and mechanical level. It provides the hardware means of sending and receiving data on a carrier, including defining cables, cards and physical aspects. b) Internetworking tools The art and science of connecting individual local-area networks (LANs) to create wide-area networks (WANs), and connecting WANs to form even larger WANs. Internetworking can be extremely complex because it generally involves connecting networks that use different protocols. Internetworking is accomplished with routers, bridges, and gateways. Routers: It is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP network. Routers are located at gateways, the places where two or more networks connect.

Routers use headers and forwarding tables to determine the best path for forwarding the packets, and they use protocols such as ICMP to communicate with each other and configure the best route between any two hosts. Bridges: It is a device that connects two local-area networks (LANs), or two segments of the same LAN that use the same protocol, such as Ethernet or Token-Ring. Gateways: It is a node on a network that serves as an entrance to another network. In enterprises, the gateway is the computer that routes the traffic from a workstation to the outside network that is serving the Web pages.

In homes, the gateway is the ISP that connects the user to the internet. In enterprises, the gateway node often acts as a proxy server and a firewall. The gateway is also associated with both a router, which use headers and

forwarding tables to determine where packets are sent, and a switch, which provides the actual path for the packet in and out of the gateway. A computer system located on earth that switches data signals and voice signals between satellites and terrestrial networks. An earlier term for router, though now obsolete in this sense as router is commonly used. c) Distributed computing systems A distributed computer system consists of multiple software components that are on multiple computers, but run as a single system. The computers that are in a distributed system can be physically close together and connected by a local network, or they can be geographically distant and connected by a wide area network. A distributed system can consist of any number of possible configurations, such as mainframes, personal computers, workstations, minicomputers, and so on. The goal of distributed computing is to make such a network work as a single computer.

Distributed systems offer many benefits over centralized systems, including the following: Scalability The system can easily be expanded by adding more machines as needed. Redundancy Several machines can provide the same services, so if one is unavailable, work does not stop. Additionally, because many smaller machines can be used, this redundancy does not need to be prohibitively expensive. Distributed computing systems can run on hardware that is provided by many vendors, and can use a variety of standards-based software components. Such systems are independent of the underlying software.

They can run on various operating systems, and can use various communications protocols. Some hardware might use UNIX(R) as the

operating system, while other hardware might use Windows operating systems. For inter machine communications, this hardware can use SNA or TCP/IP on Ethernet or Token Ring. This system contains two local area networks (LANs) that are connected to each other. One LAN consists of UNIX workstations from several different manufacturers; the other LAN consists primarily of PCs that are running several different PC operating systems.

One of the LANs is also connected to a mainframe by way of an SNA connection. The client/server model A common way of organizing software to run on distributed systems is to separate functions into two parts: clients and servers. A client is a program that uses services that other programs provide. The programs that provide the services are called servers. The client makes a request for a service, and a server performs that service. Server functions often require some resource management, in which a server synchronizes and manages access to the resource, and responds to client requests with either data or status information.

Client programs typically handle user interactions and often request data or initiate some data modification on behalf of a user. For example, a client can provide a form onto which a user (a person working at a data entry terminal, for example) can enter orders for a product. The client sends this order information to the server, which checks the product database and performs tasks that are needed for billing and shipping. Typically, multiple clients use a single server. For example, dozens or hundreds of clients can interact with a few servers that control database access.

The client is isolated from the need to know anything about the actual resource manager. If you change the database that you are using, the server

possibly needs to be modified, but the client does not need to be modified. Because usually fewer copies exist of the server than of the client, and because the servers are often in locations that are easier to update (for example, on central machines instead of on PCs that are running on users' desks), the update procedure is also simplified. Also, this approach provides additional security. Only the servers, not the clients, need access to the data that the resource manager controls.

Clients can also access several different servers, and the servers themselves can act as clients to other servers. Exactly how the functions are distributed across servers is an application design decision. For example, a single server could provide all the services that a client needs, or the client could access multiple servers to perform different requests. The application designer must consider items such as scalability, location, and security. For example, are the clients and servers local or is the application distributed over a wide geographic area? Do the servers need to be on machines that are physically secure?

Such design decisions are outside the scope of this introduction. Some servers are part of an application and are referred to as application servers. Other servers are not part of a specific application. Instead, any application can use them. For example, the CICS Structured File Server (SFS) provides record-oriented file access for applications.

Three-tiered client/server architecture A common design of client/server systems uses three tiers: 1. A client that interacts with the user 2. An application server that contains the business logic of the application 3. A resource manager that stores data.