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BASIC IT SKILLS

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& Various Central, State & Other Open Universities

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Sample Preview of the Solved Sample Question Papers

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Sample

Question Paper (Solved) 1

BASIC IT SKILLS

B.S.M.A.-001

Time: 3 Hours] *[Maximum Marks: 100*

Note: Attempt ***all*** the questions. All questions carry ***equal*** marks.

Q. 1. What is multitasking, multiprogramming, multithreading?

Ans. Ref.: See Chapter-1, Page No. 8, Q. No. 5.

Q. 2. Classify networks on the basis of distance approach and describe them briefly.

Ans. In the simplest form, data can be transferred between two devices which are directly connected through a communication channel. But, it is not practical for two devices to be directly point to point connected, due to following reasons:

- The devices may be far apart, and
- There may be a set of devices, each of which may require to connect to others at several times.

Solution to this problem is to connect each device to a communication network. Computer networks refer to a set of autonomous systems that permit distributed processing of information.

There are different approaches to the classification of computer networks.Our such classification is based on geographical coverage or distance approach. On the basis of distance approach networks can be classified into three classes:

- LAN (Local Area Network)
- MAN (Metropolitan Area Network)
- WAN (Wide Area Network)

Local Area Network (LAN)

A local area network is relatively smaller and owned by private body. It can span over in a maximum radius of 10 kms. to provide local connectivity within a building or small geographical area. In a local area network two or more competing devices are connected by same physical medium, such as a transmission cable. The LANs are distinguished from other kinds of networks by three characteristics:

- Size (Small)
- Transmission speed (10-100Mbps)
- Topology (the physical and logical layout of a LAN)

A wide variety of LANs have been built and installed, but a very few types have become dominant. Ethernet and Token Ring are the two LAN architectures that are widely used. Bridges, repeaters and switches are the network connecting devices used to interconnect LANs to expand the local network or to form larger LANs. A router is a device that can be used to connect a LAN to another LAN or WAN or MAN.

A LAN facilities user to share resources such as data, information, printers, hard disks, etc. within an organization.

Metropolitan Area Network (MAN)

A MAN can be considered as a bigger version of a LAN that can span in a radius of 50 km. and can provide regional connectivity within a campus. It is designed to extend over an entire city. It may be a single network, such as a cable television network or it may be a means of interconnecting a number of LANs into a large network; so that resources may be shared LAN to LAN as well as device to device. For example, a business organization can use a MAN to connect to the LANs in all of its offices throughout a city.

Wide Area Network (WAN)

A wide area network (WAN) is not restricted to geographical area. It may cover a geographical area of a country or continent. A WAN connects several LANs in a network, which may spread all over the globe. A wide area network interconnects LANs with a device called a router. This unable each LAN to offer its users access to resources stored on other

interconnected LANs without compromising its own identity. In other words, a router interconnects them, without condensing them into just one big LAN. But, repeaters are needed to support the extension of WAN facilities across great geographic distances. The data transfer rate of WANs is relatively slower than LANs. Transmission rates are typically 2 Mbps, 34Mbps, 155Mbps, 1625Mbps or more.

Public switched networks, banking networks, military networks, large corporate networks, stock brokerage networks and airline reservation networks are a few examples of WANs. Internet is also an example of WAN.

Q. 3. How can computers ensure more security and safety of confidential information?

Ans. Ref.: See Chapter-3, Page No. 48, Q. No. 2.

Q. 4. Describe the important features of MS-Word.

Ans. Ref.: See Chapter-4, Page No. 67, Q. No. 3.

Q. 5. What is GUI? and What are its features?

Ans. Ref.: See Chapter-5, Page No. 79, Q. No. 1.

Q. 6. How can you invoke equation editor?

Ans. Ref.: See Chapter-6, Page No. 97, Q. No. 6.

Q. 7. Explain the various components of excel screen.

Ans. Ref.: See Chapter-7, Page No. 109, Q. No. 1.

Q. 8. Write short notes on the following:

(a) **Data Life Cycle**

Ans. Ref.: See Chapter-8, Page No. 117, 'Data Life Cycle'.

(b) **Sorting Data**

Ans. Ref.: See Chapter-9, Page No. 127, 'Sorting Data'.

(c) **Time Sharing**

Ans. Ref.: See Chapter-1, Page No. 3, 'Time Sharing'.

(d) **Networking Models**

Ans. Ref.: See Chapter-2, Page No. 20, 'Networking Models'.

■■

Sample Preview of The Chapter

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BASIC IT SKILLS

Operating System

1

INTRODUCTION

Working with Computers, an Operating System (OS) would be an unpleasant complication of details. Carrying out a seemingly simple procedure, like loading an application program from disk to primary memory, would require hours of work. Application programs themselves would be longer, more complicated and more expensive than they are now. Special versions of software would have to be written for virtually every model of machines. Luckily the availability of standard Operating System has prevented all of this and more.

CHAPTER AT A GLANCE

WHAT IS AN OPERATING SYSTEM?

An Operating System run on computer hardware and serves as a platform for other software to run on the computer system.

An Operating System is a program (system software) which acts as an interface between user and computer hardware.

A Computer System can be logically divided into four components:

Computer Hardware, Operating System, Application Programs and Users. An Operating System controls and coordinates the hardware components (CPU, Memory, I/O devices) among various application programs for different users.

Applications
I/O Management
Device Drivers
Memory Management
CPU Management
Hardware

The Operating System control every task your computer carries out and manages system resources.

Operating System has two main objectives:

Convenience: An Operating System makes a computer more convenient to us.

Efficiency: An Operating System allows the computer resources to be used in an efficient manner.

Operating System is also called a **Resource Manager**. Operating System manages all computer **resources** and **allocates** them to a specific program and uses as it require completing its tasks.

The Operating System hides all the innermost details of the working of computer hardware components and provides a simple, usable and effective model of a computer. This type of image of a computer is called **virtual machine**.

The common operating systems are the windows family of operating systems (*viz*. Windows 95, 98, 2000.NT, VISTA), the UNIX family of operating systems (which includes UNIX, LINUX and many other derivatives) and the Macintosh Operating System.

GOALS OF AN OPERATING SYSTEM

Any Operating System should meet the following major goals:

(a) Optimize the use of computer resource so as to maximize its throughput.

(b) Create a user-friendly computing environment for accessing the computer resources.

(c) To hide details of hardware by creating abstraction.

(d) To allocate resources to processes (Manage resources).

(e) Provide a pleasant and effective user interface.

GENERATIONS OF OPERATING SYSTEMS

The history of computer development is often referred to in reference to the different generations of

computing devices. Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, and more powerful and more efficient and reliable devices.

Read about each generation and the developments that led to the current devices that we use today.

0th Generation: (1642-1940s)

Notable characteristics and events included:

- Mechanical gears and electromechanical relays.
- In 1642 Blaise Pascal creates mechanical calculating machine using gears, hand powered, performs + and -.
- In 1834 Charles Babbage creates the Difference Engine which runs a single algorithm to compute tables of numbers. Output was punched copper plates. Never completed. Instead, began work on Analytical Engine, a programmable machine. Never completed. Was assisted by Ada Lovelace (first programmer) to write code for machine.
- In 1930's Konrad Zuse builds a series of automatic calculating machines (Z1) similar to Babbage's but using electromechanical relays. Destroyed in 1944 by allied bombing of Berlin.

1st Generation: (1940-1956: Vacuum Tubes)

- Vacuum tubes.
- Absolute machine language using wired plug boards.
- No programming languages or operating systems.
- Programmer signed up for a block of time and brought own plug boards.
- Serial processing.
- In 1930's, John Atanasoff at Iowa State College designs and builds special purpose computer using vacuum tubes. First electronic computer but still debated. First computer to use RAM.
- In 1946, John Mauchly and J. Presper Eckert design and build first general purpose electronic computer, the ENIAC. 18,000 vacuum tubes, 1500 relays, and 30 tons. Hard-wired programs.
- In 1946, John Von Neumann writes paper on stored program concept.
- In 1951 Eckert and Mauchly complete the first commercially sold computer, the UNIVAC I. Used to predict the winner of presidential election 1952.
- IBM creates Model 650. Slow, but used punch cards.

2nd Generation: (1956-1964: Transistors)

- Transistor hardware, more reliable, sold commercially.
- Programmer would write program in FORTRAN, punch cards.
- Operator (or programmer) reads in program card deck + FORTRAN compiler card deck – Wasteful!
- Developed BUFFERING – input device reads multiple records, trying to "be ready" for CPU.
- FORTRAN introduced in 1957. COBOL introduced in 1960.
- DEC PDP-1 introduced in 1961. First mini, with 4K RAM, $120,000. 50 sold.
- IBM introduces model 1401and 7094 business computer in 1961 and1962.
- CDC introduces 6600 parallel processor number cruncher in 1964.

3rd Generation: (1964-1979: Integrated Circuits)

- IC technology
- IBM S/360 series of computers (family) created – one operating system ran on all models. OS was humongous!
- Developed MULTIPROGRAMMING – CPU switches from one job to next very quickly when: I/O needed, job finishes (errs).
- Ken Thompson wrote UNICS/UNIX based upon concepts in MULTICS.
- Developed REAL-TIME OS – SABRE airline reservation system.
- Intel introduces 8080 microprocessor in 1974. General purpose 8-bit 64K RAM.
- Motorola introduces 6800 in 1974.
- Altair 8800 introduced in 1974.
- Bill Gates rewrites BASIC for microcomputer. First programming language on a micro. (1974)
- Gary Kildall creates CP/M in 1974.
- Steve Jobs and Steve Wozniak create Apple Computer (1974-1975).
- Apple II comes out in 1977.

4th Generation: (1979-Present: Microprocessors)

- Personal Computers, LSI technology, single-user OS.
- Developed network OS-loosely connected computers, each doing its own thing.
- Developed distributed OS-more tightly connected computers, working together on a large problem.
- Security continued to improve, including access control, information flow control, and certification.
- System Structure evolved into a layered or hierarchical design.

- VAX VMS, OS/2.
- UNIX, Linux (1992-93), MVS simplified, Windows NT.
- IBM introduces IBM PC with 64K, 8088 processor (1981).
- Apple introduces LISA 68000 based (1984).
- SUN introduces its own microprocessor based on RISC technology – the SPARC (Scalable Processor Architecture).
- Early 1990s-virtual reality, Digital's Alpha Architecture (1992) – 64-bit RISC.
- PowerPC (1993) – very powerful RISC processor.
- Apple Newton (1993) – first PDA, weighed 1 pound, 20 MHz Acorn RISC.
- Intel Pentium (1993) – CISC *can* run fast, 3.1 million transistors, 60 MHz.
- Apple's Power Mac (March 1994)-first mainstream RISC pc.
- World Wide Web.
- Windows 95 – first really successful Microsoft Windows product.
- Toy Story – First all digital movie.
- NetWare v. 4, then 6.
- Windows Server NT (followed by much better 2000, 2003, 2008).
- IPv6, Multi-core processors, Apple's iPhone, Cloud computing.

TYPES OF OPERATING SYSTEMS

Operating System can be classified into one of more of the following categories: Batch OS, Multiprogramming OS, Network OS and Distributed OS.

Batch Processing Operating System

During batch processing environment, it requires grouping of similar jobs, which consist of programs, data and system commands. This type of processing is suitable is programs with large computation time with no need of user interaction or involvement. For example, payroll, forecasting, statistical analysis and large scientific number crunching programs. Users need not wait while the job is being processed. They can submit their programs to operators and collect them later. The disadvantages of batch operating systems are non-interactive environment and Off-line debugging.

Time Sharing

Time-sharing is a way of allowing several people to run program on different terminals, but on the same computer system, at the same time. This feature is only found is large Operating System. Time-sharing is a form of multi-programmed OS that operates in an interactive mode with a quick response time. The user types a request to the computer through a keyboard. The computer processes it and a response, if any is displayed on the user's terminal. A time sharing system allows many users to simultaneously share the computer resources.

Real Time Operating System (RTOS)

A real-time OS responds to the input instantly. They are used in special embedded applications. It is used in environments where a large number of events, most external to computer systems, must be accepted and processed in a short time or within certain deadlines. For example, flight control, real-time simulations, military applications, etc. General-purpose operating systems, such as DOS and UNIX, are not real-time. A primary objective of real-time system is to provide quick response times.

Multiprogramming Operating System

Multiprogramming is the concurrent execution of two or more processes. Multiprogramming operating systems are fairly sophisticated compared to batch operating systems. Multiprogramming has a significant potential for improving system throughput and resource utilization with very minor differences. Different forms of multiprogramming operating systems are multitasking, multiprocessing and multi-user operating systems.

Multiprocessing Operating System

A multiprocessing system is a computer that has more than one processor. A multiprocessing OS is one, which supports running a program on more than one Central Processing Unit (CPU). Server systems and super servers are specifically designed to support multiple processors. Super servers include a high-performance bus, tens of megabytes of error-correcting memory, RAID (Redundant Arrays of Inexpensive Disks) systems, advanced system architectures that reduce bottlenecks, and redundant features such as multiple power supplies. Multiprocessing can be of two types: Symmetric and Asymmetric. These are two methods for implementing an OS on top of a multiprocessing system:

Network Operating System

A network is a collection of software and associated protocols that allow a set of autonomous computers interconnected by a computer network to be used together in a convenient and cost-effective manner. Network Operating Systems provide features for controlling LANs (Local Area Networks) and/or internetworks (interconnected networks) and for

serving clients. Some typical characteristics of network operating systems are as follows:

1. Each computer has its own private OS instead of running part of a global system wide OS.
2. Users normally work on their own systems; using a different system requires some kind of remote login, instead of having the OS dynamically allocate processes to CPUs.
3. Users are typically aware of where each of their files are kept and must move file from one system to another with explicit file transfer commands instead of having file placement managed by the OS.

Distributed Operating System

Distributed Operating Systems often allow programs to run on several processors at the same time, thus requiring more complex scheduling algorithms as compared to centralized ones in order to achieve maximums utilization of CPU's time Fault tolerance is another area in which distributed operating systems are different. Distributed systems are considered more reliable than single processor system. They perform even if certain part of the hardware is malfunctioning. This feature has tremendous implications for the OS. The three important advantages of the distributed design of OS are:

1. Major breakthrough in microprocessor technology
2. Incremental growth
3. Reliability

Operating Systems for Embedded Devices: An embedded operating system is an operating system for embedded computer systems. These operating systems are designed to be very compact and efficient, for saking many functions that non-embedded computer operating systems provide, and which may not be used by the specialized applications they run. They are also frequently systems. Examples of embedded operating systems could include the software used in Automated Teller Machines, Cash Registers, CCTV systems, jukeboxes and such like:

Some of the popular OS are: PDAs (Personal Digital Assistants), A/Rose, LynxOS, and Free RTOS, etc.

DESIRABLE QUALITIES OF OS

Reliability: It define the execution efficiency as well as storage efficiency.

Usability: The capacity to be understand, learned and used.

Interoperability: The efforts required to couple one system to another.

Reusability: The extent to which a program can be used in other application.

Maintainability: The capability to be modified for purpose of making, corrections, improvement and changes.

OPERATING SYSTEMS: SOME EXAMPLES

The following are examples of operating systems-DOS, UNIX, WINDOWS, MACINTOSH.

DOS

The Patterson originally developed MS-DOS in 1980 from the very beginning it was designed to be a full-fledged OS for 16-bit personal computers build around the 8086 microprocessor. Patterson originally christened it 'QDOS' for 'Quick and Dirty Operating System'. The initial versions of DSO were simple and resembled CP/M. Work began on MS-DOS because; Digital Research was very slow to release a CP/M BASED OS to go with the new 8086 chip. Eventually they did, but by then MS-DOS was well established.

In 1981, IBM (International Business Machines) released its Personal Computer (PC). At the same time, it announced that MS-DOS (renamed PC-DOS) was the OS of the choice for the new machine.

UNIX

UNIX is a powerful, flexible and manageable OS with good utilities, communication abilities and GUIs. The UNIX project was justified to the management, as vehicles for document preparation the first users of UNIX were in the Bell patent department, which used the system's document preparation software. Dennis Ritchie wrote a C compiler under UNIX, and in 1973 Thompson and Ritchie rewrote the UNIX kernel in C.

WINDOWS

Windows dominates the personal computer world, running, by some estimates, on 90% of all personal computers. Windows provides as Graphical User Interface (GUL), virtual memory management multitasking, and support for many peripheral devices. Microsoft first began development of the **Interface Manager** (subsequently) renamed as Microsoft Windows in 1981.

Microsoft Windows 3.1 released in April 1992 provided significant improvements to Windows 3.0. In its first two months on the market, it sold over 3 million copies, including upgrades from Windows 3.0. It continued to sell at a rate of over 10 lakh copies per month.

WINDOWS 98

The successor to Windows 95 was released in 1998. Originally it was called Memphis, and then