



**BHARATI VIDYAPEETH'S**  
**INSTITUTE OF COMPUTER APPLICATIONS & MANAGEMENT (BVICAM)**  
(Affiliated to Guru Gobind Singh Indraprastha University, Approved by AICTE, New Delhi)  
A-4, Paschim Vihar, Rohtak Road, New Delhi-110063, Visit us at: <http://www.bvicam.in>

---

Course Code: MCA-101

Course Name: Fundamentals of IT

### **Practice Questions (Theory)**

- Q1. List different file allocation methods with their advantages and limitations. Also, show how linked allocation method is better than contiguous allocation, in terms of storage space utilization.
- Q2. Discuss the reasons why processes need to be synchronized? Also, give the necessary features of a good process synchronization algorithm.
- Q3. Consider CPU reference string given below and count number of page faults using LRU and LFU schemes:

**Ref string:** 1 2 3 3 3 4 2 5 1 4 3 4 2 3 3 2 5 3 1 1 2

Assume number of available frames: 3

- Q4. Discuss the steps followed by an OS to handle page fault? Also discuss different page replacement algorithms used to replace a victim page.
- Q5. Compare Multi-tasking, Multi-processing and Multi-threading, as characteristics of today's modern Operating Systems.
- Q6. What is race condition? Give a scenario where the order of execution of 'write' statements in processes results in different outputs.
- Q7. Convert the following:
- Binary 1011101 in decimal
  - Octal 564.34 in hexadecimal
  - Octal 234.112 in binary
  - Binary 1111.0011 in octal
  - Hexadecimal CA245.67A2 in decimal
- Q8. Design a circuit for circular shift micro-operations for a 4-bit register.
- Q9. Design logic for calculating reverse of a n-digit number inputted by the user and then write algorithm for the same.

- Q10. Design a flowchart for printing the sum of cubes of first five multiples of n, where n is an input from the user.
- Q11. Compare the techniques of black box and white box testing.
- Q12. List any four real life applications of Databases.
- Q13. Convert the following
- $(0.6234)_{10} = (?)_2$
  - $(26.3672)_{10} = (?)_{16}$
  - $(0.0101)_8 = (?)_{10}$
  - $(1010.00111)_2 = (?)_{10}$
- Q14. Draw the neat diagram of Microprocessor 8085 and explain its different components.
- Q15. Prepare the truth table and implement the circuits for:
- $R'.S.T' + S'.T' + R.S'.T'$  (USING NOR GATES ONLY)
  - $P.Q'.R + P'.Q.R' + P'.R$  (USING NAND GATES ONLY)
- Q16. Subtract 9876 from 9899 using r's complement.
- Q17. What are the different display devices ? Explain CRT and Raster Scan Display?
- Q18. What are the different types of scheduling techniques in process management?
- Q19. Differentiate between internal and external commands in DOS. Give examples of each category.
- Q20. Distinguish between different types of database models.
- Q21. What are the differences between modulation and demodulation techniques?
- Q22. What are the various modulation in data communication?
- Q23. What do you mean by switching? Explain various types of switching techniques?
- Q24. **Give some benefits of multithreaded programming.**
- Q25. What are the differences between Batch processing system and Real Time Processing System?
- Q26. What is a process scheduler? State the characteristics of a good process scheduler?

Q27. What are the different principles which must be considered while selection of a scheduling algorithm?

Q28. When does a page fault occur? Explain various page replacement strategies/algorithms.

Q29. Find out which algorithm among FCFS, SJF And Round Robin with quantum 10, would give the minimum average time for a given workload.

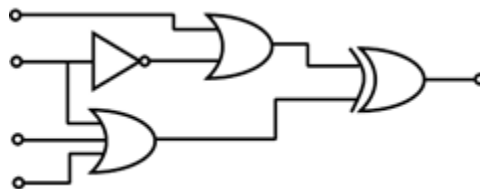
Q30. Shown below is the workload for 5 jobs arriving at time zero in the order given below –

Job	Burst Time
1	10
2	29
3	3
4	7
4	12

Now find out which algorithm among FCFS, SJF And Round Robin with quantum 10, would give the minimum average time.

Q31. A logic gate circuit with four inputs A, B, C and D and output F is shown below in Figure 1.

- (a) Determine the output (in terms of Boolean expressions) of all four logic gates in the circuit.
- (b) Complete a truth table for the function F.
- (c) From the truth table, write out a 'sum of products' expression for the function F.
- (d) Plot the sum of products function F onto a Karnaugh Map.
- (e) Directly from the Karnaugh map, write out the minimised function for F.



Q32. Subtract 10011 from 1101 using (r-1)'s complement.

Q33. Simplify the Boolean expression  $F = A.B + C.(B' + A.B)$  as far as possible by first finding an equivalent 'sum of products expression' and subsequently utilising a Karnaugh Map.

Q34. Design a circuit for  $A'B + BCD' + B.(C' + D)$  using NAND gates only.

- Q35. Simplify function  $F(A,B,C,D) = \Sigma (0,1,3,5,6,11,13,14)$  and write the simplified Boolean expression.
- Q36. Simplify function  $F(W,X,Y,Z) = \Pi (2,3,5,8,9,11,13,14,15)$  using k maps and write the simplified expression.
- Q37. a) Write the use and syntax of following DDL commands in SQL –  
Create table, drop table, alter table  
b) Write the use and syntax of following DML commands in SQL –  
Insert into, delete from, update table
- Q38. Discuss the difference in types of switching techniques- circuit switching, packet switching and message switching.
- Q39. "Physical layer in OSI model deals with physical characteristics of communication media being used for communication". Discuss the roles and responsibilities of physical layer.
- Q40. Describe the working principle and design of compact disk storage devices.
- Q41. Explain how analog signals can be digitized? Explain different modulation techniques.
- Q42. Describe the architecture of Metropolitan Area Networks (MAN).
- Q43. Explain how daisy wheel and inkjet printers work.
- Q44. Explain the following LINUX/UNIX commands (with brief examples):  
a. Ls  
b. Cat  
c. More  
d. grep

- Q45. For the given set of five processes, calculate average waiting time, average turnaround time and throughput, using **FCFS** algorithm:

Processes	Arrival Time (ms)	CPU Burst Time (ms)
P1	0	5
P2	2	3
P3	4	9
P4	5	4

### **Multiple Choice Questions**

- The OS that is self contained in a device and resident in the ROM is .....  
a. Batch OS

- b. Real time OS
  - c. Embedded OS
  - d. Multiprocessor OS
2. The example of non-preemptive scheduling algorithm is .....
    - a. FCFS
    - b. SRTF
    - c. Round robin
    - d. None
  3. The OS that allows only one program to run at a time is .....
    - a. Real-time
    - b. Batch OS
    - c. Embedded OS
    - d. Multi-programmed OS
  4. The substitution made by OS between the processes to allocate space is .....
    - a. Swapping
    - b. Fragmentation
    - c. Deadlock
    - d. Paging
  5. Which of the following is not a memory management scheme
    - a. Paging
    - b. Segmentation
    - c. Paged – segmentation
    - d. Fragmentation
  6. The fit policy of a memory manager to place in the largest block of unallocated memory is .....
    - a. First fit
    - b. Best fit
    - c. Worst fit
    - d. None
  7. The scheduler that selects a process from the ready queue and allocates CPU to it is.....
    - a. Short term
    - b. Long term
    - c. Medium term
    - d. None
  8. What allows the user to run one or more applications on the same computer so that he can switch between one and another without closing the application?
    - a. Virtual storage
    - b. Multiprocessing
    - c. Multitasking
    - d. Multithreading
  9. Which of the following is one way to solve fragmentation problem
    - a. Spooling
    - b. Compaction
    - c. Swapping
    - d. None

10. Which of the following is not an inter-networking device
  - a. Switches
  - b. Hubs
  - c. Routers
  - d. Packets
11. Which of the following cable supports highest transmission rate
  - a. Coaxial cable
  - b. UTP
  - c. Fiber optics
  - d. Twisted pair
12. The transmission mode which allows both communicating devices to transmit and receive data simultaneously is .....
  - a. Simplex
  - b. Half duplex
  - c. Full duplex
  - d. None
13. PSTN uses ..... Switching techniques
  - a. Circuit
  - b. Packet
  - c. Message
  - d. None
14. Device that work at data link layer is .....
  - a. Hub
  - b. Switch
  - c. Router
  - d. Gateways
15. Routers are able to identify ..... addresses in the network
  - a. Logical
  - b. Physical
  - c. Both
  - d. None
16. MAC addresses are generated by which layer in the OSI model
  - a. Physical
  - b. Data link
  - c. Network
  - d. Transport
17. ALU works on the instructions and data held in .....
  - a. Registers
  - b. I/O devices
  - c. Buffer
  - d. System Bus
18. The fastest memory in computer system is .....
  - a. RAM
  - b. ROM
  - c. Cache
  - d. None

19. The secondary storage device that follows the sequential mode of access is .....
- Optical disk
  - Magnetic tape
  - Magnetic disk
  - None
20. In which kind of disk does the read/write head physically touch the surface?
- Hard disk
  - Floppy
  - Compact disk
  - None
21. The access time refers to
- Time required to locate and retrieve the stored data
  - Time required to locate the lost data
  - Time required to delete the specific data on a certain memory location
  - None
22. Trackball and joystick are examples of .....
- Pointing devices
  - Scanning devices
  - Multimedia devices
  - Storing devices
23. An individual small dot on the screen is called .....
- Screen point
  - Cursor
  - Pixel
  - Character
24. Data integrity refers to
- Non duplication of data
  - Security of data
  - Accuracy
  - Centralized access
25. Which level of abstraction deals with the logical structure of entire database?
- Physical
  - Conceptual
  - External
  - None
26. Hierarchical data model is not able to represent ..... relationship
- 1:1
  - 1:M
  - M:N
  - None
27. Which of the following is not a DML command
- Update
  - Insert
  - Drop
  - Delete

28. The database model that uses a series of two dimensional tables to store information is .....
- Object oriented database model
  - Hierarchical database model
  - Relational database model
  - Network database model
29. .... is an attribute in a relation that serves as a primary key of another relation in a same database.
- Identifier
  - Foreign
  - Composite
  - Super
30. Which of the following is not a modulation technique?
- Amplitude modulation
  - Frequency modulation
  - Phase modulation
  - Time division modulation
31. Which topology covers security, robust and eliminating traffic factor?
- Mesh
  - Ring
  - Star
  - Bus
32. A Circuit-Switched Network is made of a set of switches connected by physical
- links
  - media
  - nodes
  - lines
33. A \_\_\_\_\_ gate gives the output as 1 only if all the inputs signals are 1.
- AND
  - OR
  - EXOR
  - NOR
34. The boolean expression of an OR gate is \_\_\_\_\_
- $A.B$
  - $A'B+AB'$
  - $A+B$
  - $A'B'$
35. When logic gates are connected to form a gating/logic network it is called as a \_\_\_\_\_ logic circuit.
- combinational
  - sequential
  - systematic
  - hardwired
36. The expression of an EXOR gate is \_\_\_\_\_
- $A'B+AB'$
  - $AB+A'B'$
  - $A+A.B$
  - $A'+B'$



37. Electronic circuits that operate on one or more input signals to produce standard output \_\_\_\_\_
- a) Series circuits
  - b) Parallel Circuits
  - c) Logic Signals
  - d) Logic Gates
38. The value of radix in binary number system is \_\_\_\_\_
- a) 2
  - b) 8
  - c) 10
  - d) 1
39. Which of the following is not a positional number system?
- a) Roman Number System
  - b) Octal Number System
  - c) Binary Number System
  - d) Hexadecimal Number System
40. The input hexadecimal representation of 1110 is \_\_\_\_\_
- a) 0111
  - b) E
  - c) 15
  - d) 14
41. Convert the binary equivalent 10101 to its decimal equivalent.
- a) 21
  - b) 12
  - c) 22
  - d) 31
42. Which of the following is the correct representation of a binary number?
- a)  $(124)_2$
  - b) 1110
  - c)  $(110)^2$
  - d)  $(000)_2$
43. Which of the following is not a bitwise operator?
- a) |
  - b) ^
  - c) .
  - d) <<
44. The 'heart' of the processor which performs many different operations \_\_\_\_\_
- a) Arithmetic and logic unit
  - b) Motherboard
  - c) Control Unit
  - d) Memory
45. The sign magnitude representation of -1 is \_\_\_\_\_
- a) 0001
  - b) 1110
  - c) 1000
  - d) 1001
46. The ALU gives the output of the operations and the output is stored in the \_\_\_\_\_
- a) Memory Devices
  - b) Registers

- c) Flags
  - d) Output Unit
47. The process of division on memory spaces is called \_\_\_\_\_
- a) Paging
  - b) Segmentation
  - c) Bifurcation
  - d) Dynamic Division
48. Number of bits in ALU is \_\_\_\_\_
- a) 4
  - b) 8
  - c) 16
  - d) 2
49. Which flag indicates the number of 1 bit that results from an operation?
- a) Zero
  - b) Parity
  - c) Auxiliary
  - d) Carry
50. The bitwise complement of 0 is \_\_\_\_\_
- a) 00000001
  - b) 10000000
  - c) 11111111
  - d) 11111110
51. What does MBR stand for?
- a) Main Buffer Register
  - b) Memory Buffer Routine
  - c) Main Buffer Routine
  - d) Memory Buffer Register
52. Which of the following holds the last instruction fetched?
- a) PC
  - b) MAR
  - c) MBR
  - d) IR
53. Causing the CPU to step through a series of micro operations is called \_\_\_\_\_
- a) Execution
  - b) Runtime
  - c) Sequencing
  - d) Pipelining
54. The functions of execution and sequencing are performed by using \_\_\_\_\_
- a) Input Signals
  - b) Output Signals
  - c) Control Signals
  - d) CPU
55. Opcode indicates the operations to be performed.
- a) True
  - b) False
56. CPU has built-in ability to execute a particular set of machine instructions, called as \_\_\_\_\_
- a) Instruction Set
  - b) Registers

- c) Sequence Set
  - d) User instructions
57. The length of a register is called \_\_\_\_\_
- a) word limit
  - b) word size
  - c) register limit
  - d) register size
58. The complement of the input given is obtained in case of:
- a) NOR
  - b) AND+NOR
  - c) NOT
  - d) EX-OR
59. Number of outputs in a half adder \_\_\_\_\_
- a) 1
  - b) 2
  - c) 3
  - d) 0
60. The expression of a NAND gate is \_\_\_\_\_
- a)  $A.B$
  - b)  $A'B+AB'$
  - c)  $(A.B)'$
  - d)  $(A+B)'$
61. Any electronic holding place where data can be stored and retrieved later whenever required is \_\_\_\_\_
- a) memory
  - b) drive
  - c) disk
  - d) circuit
62. Which of the following is the fastest means of memory access for CPU?
- a) Registers
  - b) Cache
  - c) Main memory
  - d) Virtual Memory
63. Size of the \_\_\_\_\_ memory mainly depends on the size of the address bus.
- a) Main
  - b) Virtual
  - c) Secondary
  - d) Cache
64. Which of the following is independent of the address bus?
- a) Secondary memory
  - b) Main memory
  - c) Onboard memory
  - d) Cache memory
65. \_\_\_\_\_ storage is a system where a robotic arm will connect or disconnect off-line mass storage media according to the computer operating system demands.
- a) Secondary
  - b) Virtual
  - c) Tertiary
  - d) Magnetic

66. What is the location of the internal registers of CPU?
- Internal
  - On-chip
  - External
  - Motherboard
67. Computer has a built-in system clock that emits millions of regularly spaced electric pulses per \_\_\_\_\_ called clock cycles.
- second
  - millisecond
  - microsecond
  - minute
68. The operation that does not involves clock cycles is \_\_\_\_\_
- Installation of a device
  - Execute
  - Fetch
  - Decode
69. Input Devices that use a special ink that contains magnetizable particles of iron oxide are \_\_\_\_\_
- Optical disks
  - Magnetic disks
  - MICR
  - Magnetic drives
70. A printer that prints one line at a time and has a predefined set of characters is called \_\_\_\_\_
- Laser
  - Drum
  - Inkjet
  - Impact
71. Name the device that converts text information into spoken sentences.
- Speech Sensors
  - Compact convertors
  - Speech Synthesizers
  - Voice systems
72. The process in which a file is partitioned into smaller parts and different parts are stored in different disks is called \_\_\_\_\_
- RAID
  - Mirroring
  - Stripping
  - RAID classification
73. Which of the following Printers have a speed in the range of 40-300 characters per second?
- Inkjet
  - Laser
  - Dot matrix
  - Drum
74. FTP stands for?
- File Text Protocol
  - File Transfer Protocol
  - Firm Transfer Protocol
  - File Transplant Protocol

75. A set of overlapping divisions in the main memory are called \_\_\_\_\_
- a) Partitions
  - b) Divisions
  - c) Blocks
  - d) Modules
76. \_\_\_\_\_ is used to shift processes so they are contiguous and all free memory is in one block.
- a) Fragmentation
  - b) Compaction
  - c) External Fragmentation
  - d) Division
77. \_\_\_\_\_ searches for smallest block. The fragment left behind is small as possible.
- a) best fit
  - b) first fit
  - c) next fit
  - d) last fit
78. Which of the following isn't a type of transmission mode?
- a) physical
  - b) simplex
  - c) full duplex
  - d) half duplex
79. Fire alarms are based on this type of transmission:
- a) direct
  - b) network
  - c) analog
  - d) multiple
80. Configuration where many independent computer systems are connected.
- a) Complex
  - b) Distributed
  - c) Cloud
  - d) Incremental
81. Components used for interconnecting dissimilar networks that use different communication protocols.
- a) Switches
  - b) Gateways
  - c) Routers
  - d) Bridges
82. Components that operate at the network layer of the OSI model.
- a) Switches
  - b) Servers
  - c) Routers
  - d) Gateways
83. \_\_\_\_\_ operate at bottom two layers of the OSI model.
- a) Bridges
  - b) Switches
  - c) Models
  - d) Modules
84. OSI stands for?
- a) Open Site Interconnection
  - b) Open System Interdependence

- c) Open System Interconnection
  - d) Open Site Interdependence
85. A basic element of data in a file.
- a) Memory
  - b) Record
  - c) Field
  - d) Value
86. The user can load and execute a program but cannot copy it. This process is?
- a) Execution
  - b) Appending
  - c) Reading
  - d) Updating
87. When access is granted to append or update a file to more than one user, the OS or file management system must enforce discipline. This is \_\_\_\_\_
- a) Simultaneous access
  - b) Compaction
  - c) External Fragmentation
  - d) Division
88. Controlling the frequency is referred as \_\_\_\_\_
- a) frequency modulation
  - b) hertz modulation
  - c) amplitude modulation
  - d) phase modulation
89. What is responsible for creating a process from a program?
- a) OS
  - b) Web
  - c) Internet
  - d) Firewall
90. This cycle, of going through \_\_\_\_\_ states of running and input/output, may be repeated over and over until the job is completed.
- a) evaluation
  - b) process
  - c) program
  - d) data
91. A technique that allows more than one program to be ready for execution and provides the ability to switch from one process to another.
- a) multitasking
  - b) multiprocessing
  - c) multitasking
  - d) multiprogramming
92. Multiprogramming is mainly accomplished by:
- a) OS
  - b) software
  - c) hardware
  - d) program
93. The technique that increases the system's productivity.
- a) multiprogramming
  - b) multitasking
  - c) multiprocessing
  - d) single-programming

94. Another name for white-box testing is \_\_\_\_\_
- a) Control testing
  - b) Graybox
  - c) Glassbox
  - d) Black box
95. Which of the following is a common testing conducted by the developers?
- a) Unit testing
  - b) Entry testing
  - c) Phrase testing
  - d) Code testing
96. Which of the following is a myth in testing?
- a) Tester can find bugs
  - b) Any user can test software
  - c) Missed defects are not due to testers
  - d) Complete testing is not possible
97. Multithreading is also called as \_\_\_\_\_
- a) Concurrency
  - b) Simultaneity
  - c) Crosscurrent
  - d) Recurrent
98. Both client and server release \_\_\_\_\_ connection after a page has been transferred.
- a) IP
  - b) TCP
  - c) Hyperlink
  - d) Network
99. The memory implemented using the semiconductor chips is \_\_\_\_\_
- a) Cache
  - b) Main
  - c) Secondary
  - d) Registers
100. A \_\_\_\_\_ disk consists of a circular disk, which is coated with a thin metal or some other material that is highly reflective.
- a) magnetic
  - b) optical
  - c) compact
  - d) hard