MASTER OF COMPUTER APPLICATION
THIRD SEMESTER
OPERATING SYSTEMS
MCA-301

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs. **Full Marks : 70**

[PART-A : Objective]

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: ***1×20=20***

1. Process is:
   a. Contents of main memory
   b. A program in execution
   c. A job in secondary memory
   d. None of the above

2. The LRU algorithm:
   a. Pages out pages that have been used recently.
   b. Pages out pages that have been least used recently.
   c. Pages out the first page in a given area.
   d. None of the above.

3. Scheduling is done so as to:
   a. Increase CPU utilization
   b. Decrease CPU utilization
   c. Keep the CPU more idle
   d. None of the above

4. Memory:
   a. is the device where information is stored.
   b. is a sequence of instruction.
   c. both (a) and (b).
   d. none of the above.

5. Round Robin scheduling falls under the category of:
   a. Non-preemptive Scheduling
   b. Preemptive Scheduling
   c. Both (a) and (b)
   d. None of the above

6. Operating system is responsible for:
   a. Disk utilization
   b. Booting from the disk
   c. Deadlock recovery
   d. All of the above

7. The FCFS algorithm:
   a. First execute the job that comes last in the queue.
   b. First execute the job that comes first in the queue.
   c. First execute the job that needs minimal processor.
   d. None of the above.

8. Which of the following is not a secondary storage?
   a. Magnetic disks
   b. Magnetic tapes
   c. RAM
   d. None of the above

9. Which memory allocation policy allocates the largest hole to the process?
   a. Best-fit
   b. Worst-fit
   c. First-fit
   d. None of the above

10. Which of the following is not a process state?
    a. New
    b. Ready
    c. Running
    d. None of the above

11. Divided logical memory into blocks with the same size as frames are called:
    a. Pages
    b. Frames
    c. Page table
    d. Segmentation

12. Bringing a page into memory only when it is needed is called:
    a. Demand Memory
    b. Page fault
    c. Demand Paging
    d. Page segmentation

13. PCB stands for:
    a. Process control buffer
    b. Process controller and buffer
    c. Process control block
    d. None of the above

14. What is a long term scheduler?
    a. It selects which process has to be brought into the ready queue.
    b. It selects which process has to be executed next and allocates CPU.
    c. It selects which process to remove from memory by swapping.
    d. None of the above.

15. Turnaround time is:
    a. The total waiting time for a process to finish execution.
    b. The total time spent in the ready queue.
    c. The total time from the completion till the submission of a process.
    d. None of the above.

16. Time quantum is defined by:
    a. Shortest job scheduling algorithm
    b. Round Robin scheduling algorithm
    c. Priority scheduling algorithm
    d. Multilevel queue scheduling algorithm

17. The necessary condition needed before deadlock can occur?
    a. No mutual exclusion, Hold and wait, Preemption, Circular wait.
    b. No mutual exclusion, Hold and wait, Preemption, Circular wait.
    c. Mutual exclusion, Hold and wait, No preemption, Circular wait.
    d. None of the above.

18. When there is enough memory to fit a process in memory, but the space is not contiguous, it is known as:
    a. Internal fragmentation
    b. External fragmentation
    c. Virtual fragmentation
    d. None of the above

19. Copying a process from memory to disk to allocate space for other processes is called?
    a. Swapping
    b. Deadlock
    c. Demand Paging
    d. Page Fault

20. A system is in safe state if:
    a. The system can allocate resources to each process in some order and still avoid a deadlock
    b. There exists a safe sequence.
    c. Both (a) and (b).
    d. None of the above

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[PART-B : Descriptive]

Time : 2 hrs. 40 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Explain with diagram all possible states of a process. What is PCB? What are the useful information available in PCB? 5+5=10

2. a. What are the necessary conditions for deadlock? 4+6=10
   b. Explain Resource allocation graph in deadlock with an example.

3. Consider the following reference string with page frames '3'. Find the total number of page faults using LRU and FIFO page replacement algorithm. 5+5=10
   Reference string:
   7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

4. What are the types of operating systems? Explain each of them. 10

5. Explain the paging concept with the help of a diagram. Define first-fit, best-fit and worst -fit allocation in memory. 4+6=10

6. Write a note on Multi-level Queue scheduling. Calculate the average waiting time and turnaround time using Round Robin technique having time quantum 4 for the following table: 4+6=10

Process	Burst time (msec)
P_1	16
P_2	9
P_3	7
P_4	20
P_5	12

7. a. Define different operations possible on files. 5+5=10
   b. What is the need for a directory? Explain the different directory structures.

8. a. Explain any two-disk space allocation methods. 3+3+4=10
   b. Write a short note on 'free space management'.

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