MASTER OF COMPUTER APPLICATION
Third Semester (Repeat)
OPERATING SYSTEM
(MCA - 13)

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

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.　　　　　　　　　　　　**Marks: 50**

Answer any *four* from *Question no*. 2 to 8
***Question no*. 1 is compulsory.**

1. What is operating system and what are the services of Operating system? Explain life cycle of a process with diagram. (5+5=10)

2. Compute average waiting time and average turnaround time using (i) Round Robin (ii) Preemptive Priority process Scheduling Algorithm, take time quantum as 5ms. (10)

Process	Burst Time	Arrival Time	Priority
P1	12	0	1
P2	7	1	2
P3	5	2	3
P4	3	3	4

3. Define critical section problem. Explain the requirements that a solution to a critical section problem must have. Explain Dinning Philosopher's problem with solution. (2+3+5=10)

4. Consider the following page reference string :- (10)

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. Find number of page faults for the following page replacement algorithms assuming three frames.

a. LRU

b. FIFO

5. What is demand paging? What are its advantages? Explain how it affects the performance of a computer system. (10)

6. Distinguish between: (5+5=10)

   a. Real time system and Time sharing system.

   b. Short Term and long term scheduler.

7. Write short notes: (5+5=10)

   a. Semaphore

   b. Deadlock

8. Explain the merits and demerits of using hierarchical directory system. Explain the basic structure of the single level and two level directory systems. (5+5=10)

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Duration: 20 minutes   **Marks – 20**

(PART A - Objective Type)

I. Choose the correct answer: **1×20=20**

1. Memory
   a. is a device that performs a sequence of operations specified by instructions.
   b. is the device where information is stored.
   c. is a sequence of instructions.
   d. None

2. The FCFS algorithm
   a. executes first job that last entered in the queue.
   b. executes first job that first entered in the queue.
   c. execute first job that has been in the queue for the longest.
   d. None

3. The memory allocation scheme subject to "external" fragmentation is
   a. Segmentation
   b. Swapping
   c. Demand paging
   d. None

4. A page fault
   a. is an error on a specific page.
   b. occurs when a program accesses a page of memory.
   c. is an access to a page not currently in memory.
   d. is a reference to a page belonging to another program.

5. The CPU, after receiving an interrupt from an I/O device
   a. halts for a predetermined time.
   b. hands over control of address bus and data bus to the interrupting device.
   c. branches off to the interrupt service routine immediately.
   d. branches off to the interrupt service routine after completion of the current instruction.

6. Operating system
   a. links a program with the subroutines it references
   b. provides a layered, user-friendly interface
   c. enables the programmer to draw a flowchart
   d. None of the above

7. Semaphores were given by:
   a. Albert
   b. Dijkstra
   c. Peterson
   d. None of these

8. In a RAG, a directed arc from a resource to a process is known as
   a. Request edge
   b. Assignment edge
   c. Process edge
   d. None of these

9. Which of these file attributes helps the operating system to create an environment for a user to work on a file?
   a. File name
   b. File type
   c. File size
   d. File location

10. Which of these file operations helps the operating system to position the pointer to a specific position in a file?
    a. Delete file
    b. Append file
    c. Seek file
    d. Rename file

11. Paging is implemented in
    a. Operating system
    b. Hardware
    c. Software
    d. All of them

12. Which scheduler selects which processes should be brought into the ready queue?
    a. Real-term
    b. Long-term
    c. Mid-term
    d. Short-term

13. Belady's anomaly occurs in LRU algorithm.
    a. True
    b. False

14. Which memory allocation policy allocates the largest hole to the process?
    a. Best-Fit
    b. Worst-Fit
    c. First-Fit
    d. None of them

15. PCB stands for process command box.
    a. True
    b. False

16. A thread is
    a. Task
    b. Process
    c. Program
    d. Lightweight process

17. Process is
    a. Program on high level language kept on the disk.
    b. Contents of main memory.
    c. Program on execution.
    d. None

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

19. Error detection and correction is not a major service of Operating System.
    a. True
    b. False

20. CPU generates Physical address.
    a. True
    b. False

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