7. a) Discuss in details the memory management strategies involving contiguous memory allocation. Give suitable diagrams whenever required. 6+4=10

   b) Distinguish between the followings:
   (i) internal and external fragmentation
   (ii) paging and segmentation

8. Define the following terms: 10
   (i) Belady's Anomaly
   (ii) Semphore
   (iii) Seek time and Latency time
   (iv) Attributes of a file.
   (v) Starvation

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BACHELOR OF COMPUTRER APPLICATION
FOURTH SEMESTER
OPERATING SYSTEM
BCA-402

(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: ***1X20=20***

1. Which of the following algorithm could result in "starvation"?
   a. FCFS **b.** SJF
   c. Round Robin **d.** Priority

2. The average amount of work completed per unit time is called
   a. CPU Utilization **b.** Throughput
   c. Turnaround time **d.** Bandwidth

3. A small program which loads OS into main memory is called as-
   a. ROM **b.** Bootstrap loader
   c. BIOS **d.** None of the above

4. A thread is
   a. Task **b.** Process
   c. Program **d.** Light weighted Process

5. Which of the following is responsible for selecting a process and bringing it in the main memory?
   a. Short term scheduler **b.** Long term scheduler
   c. Medium term scheduler **d.** All of the above

6. 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 the above

7. Time taken to position read/write head on specific track is known as
   a. Rotational relay **b.** Data Transfer time
   c. Seek time **d.** Access time

8. Which of these file attributes 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

9. Which of these Directories hold all the files:
   a. Device Directory **b.** Root Directory
   c. Master file Directory **d.** All of the above

10. CPU generate
    a. Logical address **b.** Physical address
    c. Relocable address **d.** None of these

11. "Replace a page that has not been used for the longest period of time"- is the criteria of which of these algorithms?
    a. FIFO
    b. LRU
    c. Optimal
    d. All of the above

12. Operating system acts as a _____.
    a. Resource manager
    b. Interface
    c. Both of these
    d. None of these

13. Which of the following requirements must be met by a solution to critical section problem?
    a. Bounded waiting
    b. Progress
    c. Mutual exclusion
    d. All of these

14. At what time the address binding occur if the process is supposed to move from one memory segment to other, during execution?
    a. Compile time
    b. Load time
    c. Run time
    d. None of these

15. SRTN is _____ scheduling algorithm.
    a. Preemptive
    b. Non preemptive
    c. Both of thee
    d. None of these

16. Which of the following algorithm is best suited to real time systems?
    a. FCFS
    b. Round Robin
    c. SRTN
    d. Priority

17. Program is a _____ entity while process is _____.
    a. Passive, active
    b. Active, passive
    c. Both active
    d. Both passive

18. The semaphore, whose value is either zero or one is known as
    a. Binary semaphore
    b. Counting semaphore
    c. Mutex
    d. None of these

19. Larger page size causes _____ memory wastage.
    a. More
    b. Less
    c. No effect
    d. None of the above

20. Fixed partitioning method suffers from _____ fragmentation.
    a. Internal
    b. External
    c. Both of these
    d. None of thee

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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. Given the following information: 5+5=10
   Compute the average waiting time and average turnaround time for the following scheduling algorithms:

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

   (i) Round Robin (q=2)
   (ii) Preemptive SJF

2. What is an Operating System? Describe briefly how the operating system has been evolved from serial processing to multiprogramming system. 2+8=10

3. a) Define Deadlock. What are the 4 conditions necessary for Deadlock? Explain them. 5+5=10
   b) Along with the algorithm, explain the classical Dining Philosopher's Problem.

4. a) Define the term Process. Explain different states of a process along with suitable diagram. 2+4+4 =10
   b) Explain the relative merits and demerits of using hierarchical directory structure over single level and two level directory structures.

5. a) Give the hardware description and various features of a magnetic disk along with a suitable diagram. 6+4=10
   b) Explain the differences between a process and a thread.

6. Consider the following page reference string: 10
   7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
   How many page faults would occur for the following page replacement algorithms, assuming 3 frames?