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Total No. of Printed Pages: [02]

Total No. of Questions: [09]

**B.Sc. IT (Semester – 4th)
OPERATING SYSTEMS
Subject Code: BCSE0-F94
Paper ID: [OE2130423]**

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

Q1. Attempt the following:

- a. Define the term Virtual memory.
- b. Why there is a need to synchronize processes?
- c. Differentiate between binary semaphore and counting semaphore.
- d. What is thrashing?
- e. Explain State file system and object types.
- f. Difference b/w preemptive and non- preemptive scheduling.
- g. Explain the Static and buffer overflow.
- h. What are the advantages of using distributed operating system?
- i. Explain deadlock
- j. Consider a logical address space of 4 pages of 512 addressable words each, mapped onto a physical memory of 16 frames.
 - i. How many bits are there in the logical address?
 - ii. How many bits are there in the physical address?

Section – B

(5 marks each)

Q2. What is the role of scheduler? Differentiate among short, medium and long term scheduler.

Q3. For the following reference string

5, 6, 7, 8, 5, 6, 9, 5, 6, 7, 8, 9

Count the number of page faults that occur with 3 frames and 4 frames using FIFO page replacement method. Discuss the result.

Q4. Explain the implementation of semaphores in attaining process synchronization.

Q5. What is the difference among deadlock avoidance, detection and prevention?

Q6. Find the number of page faults using First In First Out (FIFO) and Least Recently Used(LRU) page replacement algorithm for given series of page references if the size of frame is 4.

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Section – C

(10 marks each)

Q7. What is an operating system? State and explain the basic functions of operating system?

Q8. Consider the following processes

Processes	BT	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes arrived in order P1 to P5 all at 0

- Draw Gantt chart to show the execution using FCFS, SJF, non-preemptive priority (smaller priority implies higher priority).
- Calculate average TAT and WT.

Q9. What are the common techniques for structuring the page table? Explain at least three of the techniques.