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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (AIML/ AI &DS/ IOT/ Cyber Security including Block Chain
Technology/CSE) (Sem.-4)**

OPERATING SYSTEMS

Subject Code : BTCS-402-18

M.Code : 77628

Date of Examination :22-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of TEN questions carrying TWO marks each.
2. **SECTION-B** contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. **SECTION-C** contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. Give an example where a system moves from safe state to unsafe state when managing deadlock.
- b. Explain the concept of virtual machine.
- c. What is device queue? How it is maintained in memory?
- d. Explain the role of medium term scheduler.
- e. Which scheduling algorithm has lowest response time? Justify.
- f. Differentiate between response time and waiting time with the help of an example.
- g. Explain the concept of race condition with the help of an example.
- h. How can we resolve the problem of circular wait in deadlock prevention?
- i. How is the logical address represented while implementing paging contains? What can be the maximum value of the offset and why?
- j. List various file access methods.

SECTION-B

2. Write Peterson's algorithm for 2 process synchronization problem. Justify how it resolves mutual exclusion, bounded wait and progress?
3. What is wait-for-graph in deadlock avoidance? Give an example where wait-for-graph ensures that system does not move from safe state to unsafe state.
4. What is segmentation? Explain how the logical address generated by CPU is converted into physical address using segmentation.
5. Define process. List various process states and explain the transition between these states.
6. What different methods of directory implementation?

SECTION-C

7. Explain various steps to handle page fault when no free frame is available. Also explain LRU and Optimal Scheduling Algorithm.
8. What is deadlock avoidance? Write the banker's algorithm (resource request and safety algorithms). Give an example.
9. **Write short note on:**
 - a. MUTEX lock in process synchronization.
 - b. Round-robin scheduling algorithm.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.