# Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

## Fourth Semester B.E. Degree Examination
### Operating Systems

**TIME: 03 Hours**                                                                 **Max. Marks: 100**

Note:   Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| | | **Module -1** | Bloom's Taxonomy Level | Marks |
|---|---|---|---|---|
| Q.01 | a | Explain the dual mode operation of operating system. | L2 | 7 |
| | b | What is operating system? Explain multiprogramming and time sharing systems. | L2 | 8 |
| | c | Explain the types of multiprocessing and types of clustering. | L2 | 5 |
| | | OR | | |
| Q.02 | a | Describe the implementation of interprocess communication using shared memory and message passing approaches. | L2 | 8 |
| | b | Explain the process states with a neat diagram. | L2 | 6 |
| | c | With a neat diagram explain the concept of virtual machines. | L2 | 6 |
| | | **Module-2** | | |
| Q. 03 | a | Explain the multithreading models with diagrams. | L2 | 6 |
| | b | Discuss the threading issues with multithreaded models. | L1 | 6 |
| | c | For below processes compute the average waiting time using RR(q=2), FCFS, SJF scheduling algorithms | L3 | 8 |

| Process | Arrival Time | Burst Time |
|---|---|---|
| p1 | 0 | 9 |
| p2 | 0 | 5 |
| p3 | 2 | 6 |
| p4 | 3 | 7 |

| | | OR | | |
|---|---|---|---|---|
| Q.04 | a | Illustrate how Reader's-Writer's problem can be solved by using semaphores. | L4 | 8 |
| | b | What are Monitors? Explain dining Philosopher's solution using monitor. | L2 | 6 |
| | c | Illustrate Peterson's solution for critical section problem. | L4 | 6 |
| | | **Module-3** | | |
| Q. 05 | a | Determine whether the following system is safe using Banker's algorithm. If the request for p1 arrives for (1 0 2) can the request be granted immediately. | L3 | 10 |

| Process | Allocation<br>a b c | Maximum<br>a b c | Available<br>a b c |
|---|---|---|---|
| p0 | 0 1 0 | 7 5 3 | 3 3 2 |
| p1 | 2 0 0 | 3 2 2 | |
| p2 | 3 0 2 | 9 0 2 | |
| p3 | 2 1 1 | 2 2 2 | |
| p4 | 0 0 0 | 4 3 3 | |

| | b | What is deadlock? What are necessary conditions for deadlock? | L1 | 5 |
|---|---|---|---|---|
| | c | What is resource Allocation Graph? Explain how it is very useful in describing deadly embrace by considering an example. | L2 | 5 |
| | | OR | | |
| Q. 06 | a | Discuss the various approaches used for deadlock recovery. | L2 | 6 |
| | b | Illustrate with example, the internal and external fragmentation problem | L4 | 6 |

| | | | | |
|---|---|---|---|---|
| | | encountered in continuous memory allocation. | | |
| | c | Explain the structure of page table. | L2 | 8 |
| **Module-4** | | | | |
| Q. 07 | a | Illustrate how demand paging affects systems performance. | L4 | 8 |
| | b | Describe the steps in handling a page fault. | L2 | 8 |
| | c | What is thrashing? How it can be controlled? | L1 | 4 |
| OR | | | | |
| Q. 08 | a | Explain briefly the various operations performed on files. | L2 | 8 |
| | b | Explain the various access methods of files. | L2 | 6 |
| | c | Explain the various methods in implementing file systems. | L2 | 6 |
| **Module-5** | | | | |
| Q. 09 | a | With a neat diagram explain in detail the components of a Linux Operating System. | L2 | 8 |
| | b | Explain different IPC mechanisms available in Linux. | L2 | 6 |
| | c | Explain process scheduling in a Linux system. | L2 | 6 |
| OR | | | | |
| Q. 10 | a | Describe on different Linux kernel modules. | L2 | 8 |
| | b | Explain the various disk scheduling algorithms with example. | L2 | 8 |
| | c | Write a short note on portability issues in Linux. | L1 | 4 |