

Code No: 183BV**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year I Semester Examinations, February - 2024****OPERATING SYSTEMS****(Common to CSE(AI&ML), CSE(IOT), AI&ML)****Time: 3 Hours****Max. Marks: 60****Note:** This question paper contains two parts A and B.i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART- A**(10 Marks)**

- 1.a) What is a system call? [1]
- b) What are the characteristics of an operating system? [1]
- c) Define scheduler. [1]
- d) What is the purpose of wait() system call? [1]
- e) Name few hardware instruction that can be used for process synchronization. [1]
- f) What is meant by resource preemption? [1]
- g) What is physical address? [1]
- h) Why internal fragmentation occurs? [1]
- i) What is a file descriptor? [1]
- j) Give syntax and semantics of write() system call. [1]

PART-B**(50 Marks)**

2. Explain about time shared and distributed systems. [10]
- OR**
- 3.a) What are the services of an operating system? Explain.
 - b) What is a parallel system? How does it differ from distributed system? [5+5]
- 4.a) What is process control block? Explain.
 - b) Explain about exec() system calls. [4+6]
- OR**
5. Simulate FCFS and round robin (time quantum=2 units) scheduling algorithms on following data using and compute average waiting time and average turn around time. [10]

Process id	Arrival time	Burst time
P1	0	2
P2	1	5
P3	3	11
P4	4	7
P5	6	4

6. What is resource allocation graph? How is it useful in deadlock avoidance and detection? [10]

OR

7. Explain how semaphores can be used for process synchronization. [10]

8. What is segmentation and paging? Explain address translation scheme in segmentation with paging. [10]

OR

9. Simulate FIFO, LRU, and optimal page replacement algorithms on following reference string and find number of page faults (number of frames=3):

1,2,3,2,1,4,2,6,7,5,4,3,4,4,5 [10]

10.a) Explain various file allocation methods.

b) Explain about open() and ioctl() system calls. [5+5]

OR

11.a) Explain various file access methods.

b) List and explain various methods for free space management. [5+5]

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