

**Code No: 153CP****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year I Semester Examinations, April/May - 2023****OPERATING SYSTEMS****(Artificial Intelligence and Data Science)****Time: 3 Hours****Max. Marks: 75****Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A****(25 Marks)**

- 1.a) Define system calls. [2]
- b) What is hard real time system? [3]
- c) What are Pthreads? [2]
- d) Which scheduling algorithm could result in starvation and why? [3]
- e) What is the use of resource allocation graph? [2]
- f) What are message queues? [3]
- g) What is logical address? [2]
- h) Define internal fragmentation. [3]
- i) List different file attributes. [2]
- j) What is 'ioctl' system call? [3]

**PART – B****(50 Marks)**

2. Distinguish between multi programmed and Time- sharing systems. [10]

**OR**

3. Summarize multiprogramming operating systems and batch processing operating system. [10]

- 4.a) Draw and explain process state diagram.
- b) Discuss about fork() and exec() system calls. [5+5]

**OR**

5. Explain the concept of process creation and write a C program to fork process separately. [10]

6. Discuss about semaphores and semaphore implementation with suitable pseudocode. [10]

**OR**

7. What are deadlocks? How to detect and avoid deadlocks? Explain. [10]

8. Simulate page replacement algorithms on following reference string (no.of frames are 3)  
1, 2, 3, 4, 1, 3, 4, 5, 6, 3, 2, 1, 4, 3. [10]

**OR**

- 9.a) What is paging technique and explain with example?  
b) What is segmentation technique and explain with example? [5+5]
10. What is directory structure? Explain single and two-level directory structures. [10]
- OR**
11. Outline the concept of “free-space management” in files. [10]

---ooOoo---

UNIT 4 Used papers 2023