Code No: R203105L **R20** SET - 1

**III B. Tech I Semester Regular/Supplementary Examinations, December -2023**
**OPERATING SYSTEMS**
(Com to CE,EEE,ME,ECE)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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**UNIT-I**

1. a) What are the two main functions of an operating system? [7M]
   b) What is the difference between timesharing and multiprogramming systems? [7M]

(OR)

2. a) What is the difference between kernel and user mode? Explain how having two distinct modes aids in designing an operating system. [7M]
   b) There are several design goals in building an operating system, for example, resource utilization, timeliness, robustness, and so on. Give an example of two design goals that may contradict one another. [7M]

**UNIT-II**

3. a) On all current computers, at least parts of the interrupt handlers are written in assembly language. Why? [7M]
   b) Explain about process scheduling. [7M]

(OR)

4. a) Can a thread ever be preempted by a clock interrupt? If so, under what circumstances? If not, why not? [7M]
   b) Write about inter process communications. [7M]

**UNIT-III**

5. a) Explain Segmentation with Paging. [7M]
   b) Copy on write is an interesting idea used on server systems. Does it make any sense on a smartphone? [7M]

(OR)

6. a) Describe LRU in page replacement problem. [7M]
   b) If FIFO page replacement is used with four page frames and eight pages, how many page faults will occur with the reference string 0172327103 if the four frames are initially empty? Now repeat this problem for LRU. [7M]

**UNIT-IV**

7. a) Write about process synchronization. [7M]
   b) Explain about semaphores. [7M]

(OR)

8. a) Describe about recovery from dead lock. [7M]
   b) In which of the four I/O software layers is each of the following done. (i) Computing the track, sector, and head for a disk read. (ii) Writing commands to the device registers. (iii) Checking to see if the user is permitted to use the device. (iv) Converting binary integers to ASCII for printing. [7M]

**UNIT-V**

9. a) The following locking calls are made by a collection of processes. For each call, tell what happens. If a process fails to get a lock, it blocks. (i) A wants a shared lock on bytes 0 through 10. (ii) B wants an exclusive lock on bytes 20 through 30. (iii) C wants a shared lock on bytes 8 through 40. (iv) A wants a shared lock on bytes 25 through 35. (v) B wants an exclusive lock on byte 8. [7M]

b) Consider an Android system that, immediately after starting, follows these steps: 1. The home (or launcher) application is started. 2. The email application starts syncing its mailbox in the background. 3. The user launches a camera application. 4. The user launches a Web browser application. The web page the user is now viewing in the browser application requires increasingly more RAM, until it needs everything it can get. What happens? [7M]

(OR)

10. a) In many UNIX systems, the i-nodes are kept at the start of the disk. An alternative design is to allocate an i-node when a file is created and put the i-node at the start of the first block of the file. Discuss the pros and cons of this alternative. [7M]

b) Write a program that reverses the bytes of a file, so that the last byte is now first and the first byte is now last. It must work with an arbitrarily long file, but try to make it reasonably efficient. [7M]

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