

Total No. of Questions : 10]

SEAT No. :

P3391

[Total No. of Pages : 3

[5353] - 594

T.E. (Information Technology) (Semester - I)

OPERATING SYSTEM

(2015 Pattern)

Time :  $2\frac{1}{2}$  Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

**Q1)** a) Explain the significance of following shell commands [5]

- i) in
- ii) wc
- iii) umask
- iv) cut
- v) grep

b) Explain different types of schedulers in operating system. [5]

OR

**Q2)** a) Draw and explain process state diagram. [5]

b) Explain the following functions with reference to 'C' [5]

- i) pthread\_create()
- ii) pthread\_join()

**Q3)** a) Enlist and explain different IPC mechanisms. [5]

b) Explain monitors in brief. [5]

OR

P.T.O.

- Q4)** a) Write a semaphore solution for readers-writers problem. [5]  
b) Explain with an appropriate example, how resource allocation graph determines a deadlock. [5]

- Q5)** a) For the following reference string. [12]  
5, 6, 7, 8, 5, 6, 9, 5, 6, 7, 8, 9, 6, 7, 4, 9, 8  
Count the number of page faults that occur with 3 frames using FIFO, Optimal and LRU page replacement methods. Discuss the result.  
b) Explain different ways to remove external fragmentation. [6]

OR

- Q6)** a) Free memory holes of sizes 15K, 10K, 5K, 25K, 30K, 40K are available. The processes of size 12K, 2K, 25K, 20K, are to be allocated. How processes are placed using first fit, best fit and worst fit partitioning algorithm. Calculate internal and external fragmentation. [10]  
b) Explain the address translation mechanism in paging and segmentation with proper example. [8]

- Q7)** a) A disk drive has 200 cylinders, numbered 0-199. The drive is currently serving the request at cylinder 63. The queue of pending requests in FIFO order is 27, 129, 110, 186, 147, 41, 10, 64, 120. Starting from the current head position what is the total distance that disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms. [12]  
i) FCFS.  
ii) C-SCAN.  
iii) C-LOOK.  
iv) SSTF.  
b) Explain I/O buffering mechanism. [4]

OR

- Q8)** a) Write a short note on the following : [8]  
i) Directory Structure.  
ii) File sharing.  
b) Explain free space management technique. [8]

- Q9) a)** Explain in detail Linux Booting process. **[8]**
- b) List and explain different inter-process communication mechanisms in Linux operating system. **[8]**

OR

**Q10) Write short note on following :** **[16]**

- a) Memory management in Linux.
- b) Linux file system.
- c) Linux IPC mechanisms.
- d) Process management in Linux.



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