Total No. of Questions : 10] **SEAT No. :**

P3957

[Total No. of Pages : 2

[5253]-545

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

OPERATING SYSTEM

(2015 Pattern)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Question 1 or 2, 3 or 4, 5 or 6, 7 or 8, 9 or 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) What is a virtual machine? Explain the concept of virtualization. **[5]**

b) Write a shell program to check if a given string is palindrome or not. **[5]**

OR

Q2) a) State and explain multiprocessor thread scheduling approaches. **[5]**

b) How PCB helps in process state management? Explain the structure of PCB. **[5]**

Q3) a) Explain with definition, the concept of general and binary semaphore. **[5]**

b) Write a semaphore solution for dinning philosophers' problem. **[5]**

OR

Q4) a) Explain the following functions (along with parameters passed) with reference to semaphore programming in 'C' **[5]**

i) sem_post()

ii) sem_wait()

b) List the requirements of mutual exclusion. **[5]**

Q5) a) What are the common techniques for structuring the page table? Explain at least three of the techniques. **[10]**

b) For the following reference string. **[8]**

1,2,3,4,2,1,5,6,2,1,2,3,3,6

Count the number of page faults that occur with 3 frames using FIFO and LRU page replacement methods. Discuss the result.

P.T.O.

OR

Q6) a) Explain with the help of a neat diagram how TLB can be used to improve effective access time? **[10]**

b) Write a short note on: **[8]**

i) Buddy system

ii) Compaction

Q7) a) A disk drive has 200 cylinders, numbered 0-199. The drive is currently serving the request at cylinder 53. The queue of pending requests in FIFO order is 98, 183, 37, 122, 14, 124, 65, 67. 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) SCAN

iii) C-LOOK

iv) SSTF

b) Explain in brief different I/O buffering techniques. **[4]**

OR

Q8) a) List and explain in brief I/O performing techniques (at least three). **[12]**

b) Define following terms **[4]**

i) Seek time

ii) Rotational latency

Q9) a) Describe the steps for adding new system call in the Linux Kernel. **[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