*Total No. of Pages: 3* *Roll No.....*

**5th SEMESTER** **B. Tech. (MC)**

**SUPPLEMENTARY EXAMINATION** **(February-2019)**

## MC 301: Operating System

**Time: 3:00 Hours** **Max. Marks: 40**

**Note:** Answer **any five** questions. Use of calculator is permitted. Assume suitable missing data, if any.

Q1. a) Explain three types of Kernels. **(6)**

b) Explain medium term scheduler with diagram. **(2)**

Q2. Describe two preemptive and two non-preemptive CPU scheduling algorithms by giving example for each one. Also draw Gantt chart and find out the average turnaround time and average waiting time in each example you have considered above. **(8)**

Q3. Describe critical section problem with its solution. Write Peterson's algorithm and explain how it satisfies all requirements of solution of critical section problem? **(8)**

Q4. a) On a system using simple segmentation, compute the physical address for each of the logical addresses, given the following segmentation table. If the address generates a segment fault, indicate so. **(4)**

| Segment | Base | Length |
|---|---|---|
| 0 | 330 | 124 |
| 1 | 876 | 211 |
| 2 | 111 | 99 |
| 3 | 498 | 302 |

i) 0,99
ii) 2,78
iii) 1,265
iv) 3,222

b) Given references to the following pages by a program.
0,9,0,1,8, 1,8,7,8,7, 1,2,8,2,7, 8,2,3,8,3,
How many page faults will occur if the program has three page frames available to it and uses Optimal page replacement algorithm? (4)

Q5. a) On a simple paging system with $2^{24}$ bytes of physical memory, 256 pages of logical address space and a page size of $2^{10}$ bytes,

i) How many bits are in logical address?
ii) How many bits in physical address specify the page frame?
iii) How many entries are in page table?
iv) How many bytes are in a page frame?

(1*4=4)

b) In this problem, use binary values, a page size of $2^6$ bytes, and the following page table.

| In/Out | Frame |
|---|---|
| Out | 00101 |
| In | 00001 |
| In | 11011 |
| In | 11010 |
| Out | 10001 |
| Out | 10101 |
| Out | 11000 |
| In | 00101 |
| .... | .... |

Which of the following virtual addresses would generate a page fault? For those that do not generate a page fault, to what physical address would they translate? (4)



a) 0000101101001
b) 0000010010010
c) 0000100010101
d) 0000001110101

Q6. a) On a disk with 5000 cylinders, numbers 0 to 4999, compute the number of tracks the disk arm must move to satisfy all the requests 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 in the disk queue. Assume the last request serviced was at track 143 and head is moving towards the track 4999. Perform the computation by using:

i) FCFS
ii) SSTF
iii) SCAN
iv) LOOK (4)

b) What are the major methods of allocating disk space to the files? (4)

Q7. Write a short note on any four of the following: (2*4=8)

i) Swapping
ii) Overlays with an example
iii) Resource Allocation Graph
iv) Need of disk scheduling
v) RAID 1

- END -

PTO