T / O·S / I.T / CBGS / 22.11.16.

Operating System

O.P. Code : 594202

(3 Hours) **[Total Marks : 80**

N.B.: (1) Question No. **1** is **compulsory.**
(2) Solve any **three** questions out of remaining **five.**
(3) Figures to **right** indicate **full** marks.
(4) Assume suitable **data** where **necessary.**

1. **Attempt any four questions.**
(a) Explain various states of a process with the help of a state transition diagram. (5)
(b) What is Producer Consumer Problem? What is solution of example? (5)
(c) Describe and design I-node structure of Unix operating system (5)
(d) Discuss Critical Section Problem? How to solve it? (5)
(e) What is system call? Explain any four system calls. (5)

2 (a) Use following Scheduling algorithm to calculate ATAT & AWT for the following process. (10)
i) FCFS ii) Pre-emptive and non-Pre-emptive SJF iii) Pre-emptive Priority

Process	Arrival Time	Burst Time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

(b) What is Thread? Explain User Level Threads and Kernel Level Threads. (10)

3 (a) Consider the following snapshot of a system (10)

Process	Max			Allocation			Available		
	A	B	C	A	B	C	A	B	C
P0	0	0	1	0	0	1	1	5	2
P1	1	7	5	1	0	0			
P2	2	3	5	1	3	5			
P3	0	6	5	0	6	3			

Using Banker's algorithm answer the following questions
i) How many resources are there of type (A, B, C)?
ii) What are the contents of the Need matrix?
iii) Is the system in a safe state? Why?

(b) State the necessary conditions for deadlock. Explain deadlock prevention and avoidance Techniques. (10)

4 (a) Calculate page faults and Hits using FIFO, LRU and Optimal Page replacement algorithm for the following page sequence (2,3,5,4,2,5,7,3,8,7). Assume Page frame size is 3. (10)

(b) What is Kernel? Explain its types.

TURN OVER

5 (a) Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each off the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory? (10)

(b) Explain how logical address converted into physical address in paging & what is segmentation? (10)

6 Write short note on (20)

(i) Semaphore non

(ii) Compare preemptive & Preemptive scheduling.

(iii) Android OS ^

(iv) Inter process communication
