Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem - IV Examination June- 2011

Subject code: 140702

Subject Name: Operating System.

Date:10/06/2011 **Time: 10.30 am – 01.00 pm**

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What is operating System? Explain the abstract view of the components of a computer system. **5**

(b) What is scheduler? Explain queuing diagram representation of process scheduler with figure. **5**

(c) What is thread? Explain thread structure. **4**

Q.2 **(a)** What is deadlock? Explain the Banker's algorithm for deadlock avoidance. **7**

(b) Suppose that the following processes arrive for the execution at the times indicated. Each process will run the listed amount of time. Assume preemptive scheduling. **7**

Process	Arrival Time(ms)	Burst Time(ms)
P1	0.0	8
P2	0.4	4
P3	1.0	1

What is the turnaround time for these processes with Shortest Job First scheduling algorithm?

OR

(b) Consider the following set of processes with length of CPU burst time given in milliseconds. **7**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Assume arrival order is: P1, P2, P3, P4, P5 all at time 0 and a smaller priority number implies a higher priority. Draw the Gantt charts illustrating the execution of these processes using preemptive priority scheduling.

Q.3 **(a)** Explain the various page replacement strategies. **7**

(b) Given memory partition of 100K, 500K, 200K, 300K, and 600K in order, How would each of the First-fit, Best-fit and Worst-fit algorithms place the processes of 212K, 417K, 112K and 426K in order? Which algorithm makes the most efficient use of memory? Show the diagram of memory status in each cases. **7**

OR

Q.3 **(a)** What is segmentation? Explain it with example. **7**

(b) Consider the following page reference string: **7**

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.

- LRU replacement
- FIFO replacement

Q.4 **(a)** Explain steps for Direct Memory Access transfer. **6**

(b) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is **8**

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

Starting from the current head position, what is the total distance ((in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling

- FCFS
- SCAN

OR

Q.4 **(a)** Explain RAID level system. **6**

(b) Explain SSTF and LOOK disk scheduling algorithms. **8**

OR

Q.5 **(a)** Explain various file attributes and file operations in brief. **7**

(b) Explain the Trojan Horse and Trap doors program threats **7**

OR

Q.5 **(a)** Explain the linked list allocation file implementation technique. **7**

(b) Explain the Access metrics mechanism **7**

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