Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012**

**Subject code: 140702 Date: 29/12/2012**

**Subject Name: Operating System**

**Time: 02.30 pm - 05.00 pm Total Marks: 70**

## Instructions:

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

**Q.1** **(a)** Differentiate Multi-Programming, Multi-tasking ,Multiprocessing & Distributed Operating System. **07**

**(b)** Explain Client/Server & Virtual Machine Architecture of Operating System **07**

**Q.2** **(a)** Explain following in Brief: **07**

I. Kernel
II. System Call
III. Inode

**(b)** What is Semaphore? Solve producer consumer problem with use of semaphore. **07**

**OR**

**(b)** Explain Following commands in UNIX/LINUX OS. **07**

I. chmod
II. head & tail
III. cut

**Q.3** **(a)** Consider the Following set of Processes , with the length of the CPU-burst time given in milliseconds: **07**

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

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time=0.

a. Draw Four Gantt charts illustrating the execution of these processes using FCFS, SJF, non-preemptive Priority ( a small priority number implies a higher priority) , and Round Robin ( quantum =1 ) scheduling.

b. What is the average waiting time of all processes for each of the scheduling algorithms in part a ?

c. What is the average Turn around time of all processes for each of the scheduling algorithms in part a ?

| | | | |
|---|---|---|---|
| | **(b)** | Explain following in brief:<br>I Device Driver<br>II Interrupt Service Routine<br>III Thread | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Write following Shell scripts in Unix/Linux :<br>I. To find five largest files in the current directory.<br>II. To find Sum & Average of 'n' numbers | **07** |
| | **(b)** | Write C Program to create exactly four child processes on UNIX / LINUX & assign each a unique task of addition , subtraction, multiplication, Division. | **07** |
| **Q.4** | **(a)** | Explain Virtual Memory Management with Paging in Detail | **07** |
| | **(b)** | What is Dead lock ? When it occurs? How to recover from it. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain Banker's Algorithm for Multiple Resources. | **07** |
| **Q.4** | **(b)** | Explain various Page Replacement Algorithms with example. | **07** |
| **Q.5** | **(a)** | Explain Implementation of File in Operating System. | **07** |
| | **(b)** | Explain Swapping in Detail. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain following in brief:<br>I. File system consistency.<br>II. Elevator Algorithm | **07** |
| | **(b)** | Explain Device Independent I/O software. | **07** |

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