

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-IV • EXAMINATION – WINTER 2013**

**Subject Code: 140702**

**Date: 26-12-2013**

**Subject Name: Operating System**

**Time: 02:30 pm to 05:00 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** Answer the following(Any FOUR) **14**  
 (i) What is Operating System? Give functions of Operating System.  
 (ii) Define: Race Condition, Mutual Exclusion, Throughput.  
 (iii) Explain “5 State” Process State Transition Diagram with illustration.  
 (iv) Explain Goals of I/O Software.  
 (v) Give the functions of following UNIX commands: grep, cat, chmod

**Q.2 (a)** Consider the following set of processes with length of CPU burst time given in milliseconds. **07**

<u>Process</u>	<u>Burst Time</u>	<u>Priority</u>
P1	10	5
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Assume arrival order is: P1, P2, P3, P4, P5 at time 0,1,2,3,4 respectively and a smaller priority number implies a higher priority. Draw the Gantt charts for preemptive and non-preemptive priority scheduling. Calculate Average Turnaround Time and Average Waiting Time.

**(b)** Explain Files and Directory Management in UNIX Operating System. **07**

**OR**

**(b)** Answer the following **07**  
 (i) What is Process Control Block? Explain various entries of it.  
 (ii) Give the features of Real Time Operating System and Time Sharing Operating System.

**Q.3 (a)** What is Semaphore? Give the implementation of Readers-Writers Problem using Semaphore. **07**

**(b)** What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented? **07**

**OR**

**Q.3 (a)** Explain the use of Banker’s Algorithm for multiple resources for Deadlock Avoidance with illustration. **07**

**(b)** What is monitor? Give the implementation of Bounded Buffer Producer-Consumer Problem using monitor. **07**

**Q.4 (a)** Explain Virtual Memory Management with Paging in detail. Explain how Virtual Address is translated into Physical Address. Also compare Paging with Segmentation. **07**

- (b) Explain the following in brief. 07  
(i) Contiguous and Linked List Allocation for implementing File System.  
(ii) Distributed Operating Systems.

**OR**

- Q.4** (a) For the Page Reference String: 07  
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0. 1. 7, 0, 1  
Calculate the Page Faults applying (i) Optimal (ii) LRU and (iii) FIFO Page Replacement Algorithms for a Memory with three frames.

- (b) Explain the following in brief. 07  
(i) Multiprogramming with Fixed Partitions and Multiprogramming with Variable Partitions.  
(ii) File attributes and File operations

- Q.5** Answer the following. (Any TWO) 14

- (a) What are the uses of device driver and controller in OS? Explain.  
(b) Write short notes on following:  
(i) RAID level system  
(ii) Access metrics mechanism.  
(c) Answer the following.  
(i). Write a Shell script to find Factorial of a given number.  
(ii) Write a note on Generic Security Attacks.

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