

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV EXAMINATION – WINTER 2015

Subject Code: 140702

Date: 01/01/2016

Subject Name: Operating System

Time: 02:30pm to 05:00pm

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) Answer the following. **07**

- (i) What is Operating System? Give functions of Operating System.
- (ii) Explain “5 State” Process State Transition Diagram with illustration..

(b) Write short notes on: Real Time Operating System, Timesharing Operating System. **07**

Q.2 (a) Answer the following. **07**

- (i) Define: Race Condition, Mutual Exclusion, Throughput , Turnaround Time.
- (ii) Give the functions of following unix commands.
cat, cp, grep.

(b) Define Process and Thread. What is Process Control Block? Explain its various entries with their usefulness. **07**

OR

(b) Five jobs A through E arrive at a computer center with following details **07**

Job Arrival_Time CPU_Time

A	0	9
B	1	5
C	2	2
D	3	6
E	4	8

Calculate the Turnaround Time and Waiting Time for all processes applying (i) First Come First Serve (ii) Shortest Job First and (iii) Round Robin (with Time Quanta=3) algorithms.

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

(b) Explain various Disk Scheduling algorithms with illustration. **07**

OR

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

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

Q.4 (a) Explain Files and Directory Management in UNIX Operating System. **07**

(b) Why Page Replacement is necessary? Compare Optimal, LRU and FIFO page replacement algorithms with illustration. **07**

OR

Q.4 (a) Explain Virtual Memory Management with Paging in detail. Explain how Virtual Address is translated into Physical Address. Give the advantages of Paging over Segmentation. **07**

- (b) Explain the following in brief. 07
(i) Contiguous and Linked List Allocation for implementing File System.
(ii) File Attributes and File Operations.
- Q.5** (a) Write short notes on following: 07
(i) Security Threats of Operating System.
(ii) Access metrics mechanism.
- (b) Write following Shell scripts in Unix/Linux : 07
(i) To find Factorial of a given number.
(ii) For generating students' mark sheet. Calculate "CLASS" also.
- OR**
- Q.5** (a) What are the use of device driver & controller in OS? Explain. 07
(b) Explain UMA and NUMA multiprocessors. 07
