53 (IT 502) OPSY

2017

OPERATING SYSTEM

Paper : IT 502

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. Answer briefly : 5×4=20

   (i) Define Operating System. List the objectives of an operating system.

   (ii) With a neat diagram explain various states of process.

   (iii) Give the Peterson's solution to the critical section problem.

   (iv) What is race condition, give *one* example ?

2. *(a)* What is Semaphore? Write the pseudocode and explain how semaphore can solve producer-consumer problem. 10

(b) What is Readers and Writers problem? Write the pseudocode for Readers and Writers to solve the problem. 10

3. Consider the following set of processes 10+5+5=20

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.

(i) Draw four Gantt charts that illustrate the execution of those processes using the following scheduling algorithm : FCFS, SJF, nonpreemptive priority (a smaller priority number implies a higher priority) and RR (quantum = 1).

(ii) What is the turnaround time of each process for each of the scheduling algorithm ?

(iii) What is the waiting time of each process for each of the scheduling algorithm ?

4. (a) Write the necessary conditions that cause deadlock situation to occur. Discuss the Banker's algorithm to avoid deadlock. 4+6=10

(b) Why should page replacement be performed ? Compare FIFO, Optimal and LRU page replacement algorithms. 10

5. (a) What is the use of system call ? Write the functions and syntax of *any five* system calls. 10

(b) Discuss the *three* basic I/O techniques those involve in various I/O operations. 10

6. Write short notes on : ***(any four)*** 5×4=20

(i) Monolithic System

(ii) Process Hierarchy

(iii) Dining Philosopher Problem

(iv) Thread Scheduling

(v) Virtual Memory.