53 (IT 502) OPSY

2018

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. *(a)* What is an Operating System ? Discuss various types and structures of operating systems. 10

   (b) Explain how Operating Systems act as Resource Manager and Extended Machine. 10

2. 5×4=20

   (i) Explain the race condition situation considering printer spooler directory as a shared resource.

   (ii) What is swapping and when is it used ?

(iii) What is a critical section problem ? Give conditions that a solution to the critical section problem must satisfy.

(iv) Briefly explain the Readers-Writers problem.

3. (a) Explain the three-level scheduling used in batch systems. 5

(b) Suppose that the following processes arrive for execution at the time indicate : 15

Process	Arrival Time	Burst Time
P1	0	10
P2	1	2
P3	2	3
P4	3	1
P5	4	5

What are the average waiting time and turnaround time for these processes with (Time quantum = 2*sec*)

(i) FCFS Scheduling algorithm

(ii) SJF Scheduling algorithm

(iii) Round Robin Scheduling algorithm ?

4. (a) What are the advantages of Inter-process communication ? Discuss *any two* approaches to achieve mutual exclusion. 10

(b) State the producer-consumer problem. Write pseudocode to solve the producer-consumer problem using Message passing approach. 10

5. (a) How the deadlock occurs ? What is the difference between deadlock prevention and avoidance ? 5

(b) Compare and contrast the following policies of resource allocation. 15

(i) All resources request together

(ii) Allocation using global numbering

(iii) Allocation using Banker's Algorithm.

6. (a) Why should page replacement be performed ? Compare FIFO, Optimal and LRU page replacement algorithm. 10

(b) What is an I/O module ? Explain briefly the three different I/O techniques used in various I/O operations. 10
