Total number of printed pages–4

53 (IT 502) OPSY

2019

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 in short : 2×10=20

   (a) What is process synchronization ?

   (b) Define the term distributed operating system.

   (c) What is the kernel in operating system ?

   (d) What is a spin lock ?

   (e) State the priority inversion problem.

   (f) What are the throughput and turnaround time ?

Contd.

(g) What is a critical region ?

(h) What is a thread ?

(i) Define starvation in deadlock.

(j) What is a system call ?

2. 5×4=20

(a) Explain how operating system acts as resource manager.

(b) What is race condition ? Give *one* example.

(c) What is strict alternation approach to the critical region problem ? State its disadvantage.

(d) Discuss how producer consumer problem can be solved using message passing approach.

3. (a) Consider the following processes with their arrival time and CPU burst time. 15

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

Calculate the average waiting time and turnaround time for those processing using FCFS, SJF and Round Robin (time quantum = 2 *sec.*) scheduling algorithms. 15

(b) Discuss with diagram the three level scheduling used in batch operating system. 5

4.

(a) Compare and contrast the following resource allocation policies : 15

(i) All resources request together

(ii) Allocation using global numbering

(iii) Allocation using Banker's algorithm.

(b) What is deadlock ? Write the necessary conditions that cause deadlock situation to occur. 5

5.

(a) Why should page replacement be performed ? Compare the following page replacement algorithms - FIFO, Optimal and LRU. 10

(b) What is the use of an I/O module ? Discuss the three basic I/O techniques those involved in various I/O operations. 10

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

(a) Diving Philosophers Problem

(b) Monolithic system

(c) Swapping and paging

(d) Process states

(e) Peterson's solution.
