53 (CS 303) OPSY

2017

OPERATING SYSTEM

Paper : CS 303

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions.*

1. *(a)* Briefly answer the following questions : 2×5=10

   (i) What are the purposes of swapping ?

   (ii) What are the benefits of multithreading ?

   (iii) What is demand paging ?

   (iv) What is virtual memory ?

   (v) What is memory compaction ?

(b) Pointwise differentiate between the following : 2×5=10

(i) Pre-emptive scheduling and non-pre-emptive scheduling.

(ii) Multiprogramming and multiprocessing.

(iii) Real-time processing and online processing.

(iv) Kernel level thread and User level thread.

(v) Internal fragmentation and external fragmentation.

2. (a) Mention *five* functions of an operating system. 5

(b) Define distributed operating system. What are its advantages ? 2+3=5

(c) What is batch processing ? Point out its advantages and disadvantages. 2+3=5

(d) What is a process ? Briefly describe the functions of its sections. 1+4=5

3. *(a)* Briefly describe about the process states in a process life cycle with a diagram. 8

(b) What is the importance of process control block ? 3

(c) Give *four* comparisons among the short-term, medium-term and long-term schedulars. 4

(d) What is race condition ? How can it be avoided ? 2+3=5

4. *(a)* What is control synchronization ? Give a suitable example. 2+4=6

(b) Apply the following scheduling algorithms for the calculation of average waiting time of the processes mentioned below : 3×3=9

(i) Round robin scheduling (quantum=4)

(ii) Shortest job next (SJN)

(iii) Priority based scheduling (Greatest-priority number indicates highest priority)

Process	Arrival Time	Execution Time	Priority
P0	0	9	1
P1	1	10	3
P2	2	15	1
P3	3	7	4

(c) How does inter-process communication take place among the processes ? Explain in detail. 5

5. (a) Briefly describe the techniques used to implement virtual memory. Explain each one with the help of suitable diagrams. 2×2+3×2=10

(b) What are the necessary conditions for dead to occur ? Explain a deadlock avoidance algorithm with a suitable example. 4+6=10

6. (a) Define the following : 2×3=6

(i) Page replacement algorithm

(ii) Page fault

(iii) Reference string

(b) Briefly describe the following page replacement algorithms : 2×2=4

(i) LRU

(ii) Optimal.

(c) Apply the above algorithms to the following reference string to find the page fault rate.

Reference String : 1, 2, 0, 6, 4, 0, 1, 3, 1, 2, 0, 1.

2×3=6

(d) Illustrate multi-level queue scheduling algorithm. 4

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

(a) Batch monitor

(b) Garbage Collection

(c) Time-sharing System

(d) Network Operating System

(e) Thread.
