53 (CS 303) OPSY

2018

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 describe the following : 2×5=10

   (i) Demand Paging

   (ii) Preemptive scheduling

   (iii) Race condition

   (iv) Throughput

   (v) Turnaround time.

(b) State true **or** false : 1×5=5

(i) Banker's algorithm deals with deadlock prevention.

(ii) Context switching never takes place in round robin scheduling.

(iii) FCFS is best suited for time sharing operating system.

(iv) Page fault occurs when the reference page is not available in memory.

(v) A process in memory is called a program.

(c) Fill up the blanks in one word : 1×5=5

(i) _____ is known as command interpreter.

(ii) Each light weight process is called a _____.

(iii) A small unit of time is called _____ in round robin scheduling.

(iv) Swapping is a method to improve the _____ utilization.

(v) CPU performance is measured through _____.

2. (a) Differentiate between the following : 2×5=10

(i) Kernel level threads and user level threads.

(ii) Internal fragmentation and external fragmentation.

(iii) Scheduling and processing.

(iv) Paging and segmentation.

(v) Real time processing and online processing.

(b) Briefly describe the functions of the sections of a process. 4

(c) Briefly describe the process life cycle with a diagram. 6

3. (a) Explain the Shortest Job First Scheduling algorithm with an example. 6

(b) In a FCFS scheduling algorithm, consider the following four processes $P1$, $P2$, $P3$ and $P4$ with arrival time and CPU burst time as follows :

Process	Arrival time	Burst time
$P1$	0	5
$P2$	1	10
$P3$	2	8
$P4$	3	3

(i) Find average waiting time. 4

(ii) Find average turnaround time. 4

(c) Define Thread. Give *four* advantages of a thread over a process. 2+4=6

4. (a) What are the necessary conditions for deadlock to occur ? 4

(b) Explain a deadlock avoidance algorithm with a suitable example. 7

(c) Why garbage collection is necessary ? How garbage collection can be achieved ? 2+3=5

(d) Illustrate multi-level queue scheduling. 4

5. *(a)* Briefly describe the following terms : 2×4=8

(i) Reference string

(ii) LRU algorithm

(iii) Optimal algorithm

(iv) FCFS algorithm.

(b) Apply LRU, Optimal and FCFS algorithms to the following reference string.

Reference string : 3,7,0,5,4,7,4,3,0,5,6, 8,3,4,9,0.

Note : Maximum pages can be stored in the memory at a time is 4. 3×3=9

(c) Briefly explain about virtual memory. 3

6. *(a)* What is Distributed System ? Mention its *four* advantages. 2+4=6

(b) What is a Batch Monitor ? Mention its functions. 2+3=5

(c) Give *four* differences between long-term and medium-term schedulars. 4

(d) Mention *five* functions of Kernel. 5

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

(a) Batch processing

(b) Inter-process communication

(c) Process Control Block

(d) Network Operating System

(e) Memory compaction.
