53 (CS 303) OPSY

2016

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)* Differentiate between : 2×5=10

   (i) Multiprogramming and multiprocessing

   (ii) Ready state and running state

   (iii) Pre-emptive and non pre-emptive scheduling

   (iv) Scheduling and Processing

   (v) Kernel level Thread and User level Thread

(b) How *two* processes communicate with one another ? Explain. 5

(c) What is batch monitor ? Mention the functions of batch monitor. 2+3=5

2. (a) Mention *five* functions of Kernel. 5

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

(c) What actions are performed by an operating system while creating a new process ? 5

(d) Describe the structure of an Operating System. 5

3. (a) What is deadlock ? What are the necessary conditions for deadlock to occur ? 2+4=6

(b) What is banker's algorithm ? Explain it with a suitable example. 2+6=8

(c) Define distributed operating system. Mention its advantages. 2+4=6

4. *(a)* Briefly explain *two* popular strategies of resource allocation. 3+3=6

(b) What is data synchronization ? How can it be achieved ? 2+2=4

(c) What is an event ? Mention *four* events pertaining to a process. 1+4=5

(d) What is throughput ? Find the throughput of the following problem using a scheduling algorithm : 2+3=5

Position in batch	Execution requirement (X_i)	Turn around Time (T_i)	Weighted Turn around (W_i)
1	5	5	1·00
2	15	20	1·33
3	12	32	2·67
4	35	67	1·91
5	5	72	14·40

5. *(a)* What is producer-consumer problem ? What conditions must be satisfied to solve this problem ? 2+5=7

(b) Explain *two* popular approaches used to identify and reuse free memory areas in a heap. 4+4=8

(c) Distinguish between best fit and first fit. Give a suitable example for best fit. 2+3=5

6. (a) What is virtual memory systems ? Explain *two* approaches to implement virtual memory systems. 2+2+2=6

(b) Define the term page fault, demand paging and page reference strings. 2×3=6

(c) What do you mean by page replacement ? Explain briefly *three* page replacement policies. 2+3×2=8

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

(a) Process Control Block (PCB)

(b) Control Synchronization

(c) Time Sharing System

(d) Batch Processing System

(e) Real Time Operating System (RTOS)
