53 (IT 502) OSYS

2015

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 a virtual machine? What are the advantages of virtual machine? Explain Java virtual machine. 2+3+5=10

   (b) Explain Process State Transition with a diagram. 5

   (c) Define Process Control Block. Differentiate between Process and Thread. 2+3=5

2. *(a)* What is critical section ? How can mutual exclusion be enforced in critical section ? Explain *any one* method. 2+3+5=10

(b) What is the difference between contiguous and non contiguous memory allocation ? Explain Pagin with *one* example. 4+6=10

3. Explain RAID structure with diagram. 20

4. What is the main principle of virtual memory ? What is page fault ? How page fault rate can be reduced ? Explain Optimal page replacement algorithm with *one* example. 3+3+4+10=20

5. *(a)* Explain with a diagram DMA transfer. 10

(b) Consider the following set of processes :

Process	Arrival Time	Service Time
A	0	10
B	2	6
C	4	2
D	6	5
E	8	2

Draw the Gantt chart corresponding to the schedule produced by shortest Remaining Time First scheduling algorithm. Determine average turnaround time, throughput and average waiting time. 10

6. *(a)* What is disk scheduling? Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

   Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?

   (i) FCFS

   (ii) SSTF 2+8=10

   (b) What is deadlock? What are the conditions for deadlock? How to detect deadlock? 2+4+4=10

7. Write short notes on : 2×10=20

   (a) Banker's algorithm

   (b) Computer security.
