OPERATING SYSTEM

Full Marks -- 70

Pass Marks -- 28

Time -- Three hours

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

Answer any *five* questions.

1. (a) Define the three basic concepts in Operating System. 3

   (b) Explain multi-programming and time sharing operating system. 3+3=6

   (c) With the help of a diagram, explain the different process states. 5

2. (a) Consider the following set of processes with the length of CPU burst times :

Process	Burst time	Priority
P1	10	3
P2	1	1

Process	Burst time	Priority
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to arrive at time 0.

(i) Draw the Gantt charts for FCFS and priority scheduling.

(ii) What is the turnaround time for each process for each of scheduling algorithms given above ?

(iii) Calculate average waiting time of each process.   4+3+3=10

(b) Write a brief note on paging memory management scheme.   4

3. (a) Consider the following page reference string :

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms assuming 4 page frames ?

(i) LRU replacement

(ii) FIFO replacement.   3+3=6

(b) Explain implementation of file system in UNIX.   4

(c) Define briefly the terms 'protection' and 'security' in context of files.   4

4. (a) Define :   2×3=6

     (i) Device drivers

     (ii) Types of terminals

     (iii) Sectors, tracks and cylinders.

(b) Explain the term spooling.   2

(c) What are the characteristics of dedicated and shared devices ?   4

(d) Define deadlock.   2

5. (a) Explain the four necessary conditions of deadlock.   4

(b) How can deadlocks be prevented ?   3

(c) Explain the concept of safe and unsafe state of a system with reference to Banker's algorithm.   4

(d) Briefly describe the workstation server model in context of distributed OS.   3

6. Write short notes on any *four* : 3½×4=14

   (a) Methods of file allocation

   (b) File accessing methods

   (c) Round-Robin scheduling

   (d) Swapping and segmentation

   (e) Processor pool model.