

- N.B. :** (1) Question No.1 is **compulsory**.  
 (2) Attempt any **four** questions from remaining **six** questions.  
 (3) Illustrate answer with **sketches** wherever **required**.

1. (a) What is operating system ? Explain in brief the evolution of operating system 10  
 over the years.  
 (b) What are the objectives and functions of O.S ? Explain in brief 'Modern Unix 10  
 Kernel'.
2. (a) Explain multiprocessor scheduling. 10  
 (b) Explain in details reasons for process creation and process termination. 10
3. (a) Which of the following scheduling algorithms could result in starvation ? 4  
 (i) First-Come, First Serve (iii) Round Robin  
 (ii) Shortest Job First (iv) Priority.
- (b) Consider the following set of processes, with the length of CPU burst given in 16  
 milliseconds :-

Process	Burst time	Priority
P <sub>1</sub>	10	3
P <sub>2</sub>	1	1
P <sub>3</sub>	2	3
P <sub>4</sub>	1	4
P <sub>5</sub>	5	2

The processes are assumed to have arrived in the order P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, P<sub>5</sub> all at time 0.

- (i) Draw Gantt charts for : FCFS, SJF, non-preemptive priority and RR (Quantum = 1).  
 (ii) What is turn around time of each process for each of the above algorithms (FCFS, SJF, priority, RR)?  
 (iii) What is the time of each process for each of above algorithms : (FCFS, SJF, priority, RR)?  
 (iv) Which algorithm results in the minimum average waiting time ?
4. (a) What is deadlock ? Explain various deadlock prevention techniques. 10  
 (b) Explain various I/O buffering techniques. 10

