[This question paper contains 4 printed pages.]

Your Roll No. 2231291520

Sr. No. of Question Paper : 1909 G

Unique Paper Code : 3122612302

Name of the Paper : Operating Systems

Name of the Course : B.Tech.

Semester : III

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Candidates are advised to read the question paper carefully.
3. Candidates are required to attempt **SIX** questions in all. Question **1** is **COMPULSORY**.
4. Question **1** is of **20** Marks, Questions **2-8** carries equal marks (**14**-Marks).
5. If a question is in divided into parts, then all parts carry equal marks.

P.T.O.

1. Answer the following questions :– (5×4)

   (i) What are Real Time Operating Systems? How they are different?

   (ii) What is thrashing? Explain with a suitable example.

   (iii) Differentiate between deadlock avoidance and prevention.

   (iv) Explain use of *ls –a, pwd, man* and *date who* Linux commands.

   (v) What are Threads? How they are different from processes?

2. What is the role of Memory Management Unit? Explain the concept of Paging. (14)

3. What is a system call? Discuss inter process communication in detail. (14)

4. Following is the sequence of page requests :

   1, 4, 6, 3, 5, 1, 2, 3, 4, 7, 9, 1, 2.

   Assume that there are three frames. How many page faults will occur with Least Recently Used (LRU) and First-In-First-Out (FIFO) algorithms? (14)

5. For the following processes and processing time :

Processes	Processing Time
P1	2
P2	5
P3	4
P4	7
P5	6

Draw the Gantt charts to show the execution of processes for FCFS and SJF methods (Presume arrival time if necessary). Also calculate the average waiting time, waiting time and turnaround time for the processes. (14)

6. Explain Bankers algorithm for deadlock avoidance. Explain with the help of a suitable example mentioning the following :

(i) Max resource available of each type.

(ii) Resource allocated and needed by the processes.

Also, find if the system is in safe state? If it is, find the safe sequence. (14)

P.T.O.

7. State and explain Dining Philosopher's Problem and its corresponding solutions using semaphores. Also write the algorithm to solve the problem. (14)

8. Write short notes on the following :– (14)

(a) Resource Allocation Graph

(b) Memory Fragmentation

(c) Process Control Block

(d) Distributed Operating System

(e) OS Kernel