M-72/2110
OPERATING SYSTEM-115
SEMESTER-I (SYLLABUS DECEMBER-2019)

TIME ALLOWED 3 Hrs

M.M 70

NOTE: The candidates are required to attempt two questions each from Section A & B Section C will be compulsory .

SECTION - A

1. Define Operating System. Explain various types of Operating Systems. (10.5)

2. Consider the following set of processes, with the length of the CPU burst given in milliseconds: (10.5)

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5 all at time 0.
   a. Draw Gantt Charts that illustrate the execution of these processes using FCFS, SJF, non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1).
   b. What is turnaround time and waiting time for each process for each of the scheduling algorithms in Part a?

3. What do you mean by Deadlock? How can a deadlock be avoided? Explain Banker's Algorithm. (10.5)

4. Explain the various File Allocation methods in detail. (10.5)

SECTION - B

5. Explain the following:
   a. Internal and External Fragmentation
   b. Mapping between Logical and Physical Address Space
   c. Difference between Paging and Segmentation.

6. Define Demand Paging. Discuss the various Page Replacement Algorithms giving examples. (10.5)

7. Discuss various Disk-Scheduling algorithms. (10.5)

8. Discuss the issues related with security in Operating Systems. How are the threats handled? Explain. (10.5)

SECTION - C

9. Attempt the following:
   a. List the various components of an Operating System.
   b. What are the needs of an Operating System?
   c. What is the difference between a process and a program?
   d. Differentiate between Pre-emptive and Non Pre-emptive Process Scheduling.
   e. What are the different Process States? Illustrate with a diagram.
   f. What is the difference between short and long term schedulers?
   g. When a system is said to be in a safe state?
   h. What do you mean by Starvation?
   i. Define Critical Section Problem.
   j. Define Access Matrix.
   k. What are System Calls? Give example.
   l. What is Throughput?
   m. What operations are performed on a directory?
   n. What are the advantages of virtual memory? (2 x 14)