4. (a) Define thread. Explain how a process differs from a thread. (CO1/CO2)

OR

(b) Write short notes on the following : (CO1/CO2)

(i) Dispatcher

(ii) Context Switch

5. (a) Differentiate between Multilevel queue scheduling *vs.* Multilevel feedback queue scheduling. (CO1/CO2)

OR

(b) Describe the functions of Operating System in concern with : (CO1/CO2)

(i) Process Management

(ii) Memory Management

(iii) File Management

(iv) I/O Management

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TMC–103

M. C. A. (FIRST SEMESTER)

MID SEMESTER

EXAMINATION, 2021-22

OPERATING SYSTEM

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) How is the operating system loaded in the memory ? List the services provided by the operating system. (CO1)

(b) Enlist the various kernel structure designs and describe each *one* along with the advantages and disadvantages. (CO1)

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2. (a) Consider the following snapshot :

Process No.	AT	Burst Time		
		CPU Burst	I/O Burst	CPU Burst
P1	0	1	5	3
P2	2	3	3	1
P3	3	2	3	1

If the CPU scheduling policy is Priority Scheduling, calculate the average waiting time and average turnaround time. (Lower number means higher priority). (CO2)

(b) Five batch jobs, A through E, arrive at a computer center at essentially the same time. They have an estimate running time of 11, 6, 2, 4 and 8 minutes, respectively. Their (externally defined) priorities are 3, 5, 2, 1 and 4 respectively, with a 5 being the higher priority.

For each of the following scheduling algorithms, determine the turnaround time for each process and the average turnaround time for all jobs. Ignore process switching overhead. Explain how you arrived at your answers. Assume that only one job at a time runs until it finishes and that all jobs are completely processor bound. (CO2)

(i) Round robin with a time quantum of 1 minute.

(ii) Priority scheduling.

3. (a) Explain the features of shell. Also differentiate between the following : (CO1/CO2)

(i) Internal Command *vs.* External Command

(ii) System Call *vs.* Library Functions

(b) Consider a system running I/O bound tasks and CPU bound task. Assume that the I/O bound tasks issue an I/O operation once for every ms of CPU computing and that each I/O operation takes 10 ms to complete. Also assume that the context switch overhead is 1 m and all the processes need 2 ms to complete. Describe the CPU utilisation for a round-robin scheduler when time quantum is 1 m. (CO1/CO2)