Roll No. .....

TBC–203/TBI–205

B. C. A./B. Sc. (IT)

(SECOND SEMESTER)

END SEMESTER EXAMINATION,

July/Aug., 2022

OPERATING SYSTEM

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) Define the following : (CO1)

(i) Multiuser OS,

(ii) Multiprogramming OS and

(iii) Real Time System.

P. T. O.

(c) Suppose the moving head disk with 200 tracks is currently serving a request for track 143 and has just finished a request for track 125.If the requests are kept in the Order

86, 147, 91, 177, 94, 150, 17, 49, 193, 34, 16, 74.

What is total head movement for the FCFS, Shortest Seek Time First, and C-SCAN scheduling ? (CO4)

5. (a) Explain the various file types in LINUX.

(b) Discuss file handling commands with proper syntax and suitable example.

(c) What are the file permissions in LINUX and how can you change the permission for a particular file ?

(b) What do you understand by user and system calls ? Illustrate it with the help of mode bit. (CO1)

(c) Explain the services of operating system in detail. (CO1)

2. (a) Consider four process P_1, P_2, P_3 and P_4 with arrival time (0, 2, 4 5) and burst time (7, 4, 1, 4) respectively, what is the average waiting time and turnaround time in SJF and Round Robin scheduling algorithm (with time quantum of 2 ns) respectively ?

(b) Draw the process state diagram and explain functionality of each state in detail. (CO2)

(c) Explain the following : (CO2)

(i) Multithreading

(ii) Context Switching

(iii) Schedulers

3. (a) What do you understand by critical section ? Discuss Whether Peterson's solution satisfies the requirement of a mechanism to control access to critical section ? (CO3)

(b) Write Short notes on the following : (CO3)

(i) Deadlock

(ii) Starvation

(iii) Semaphores

(c) Find all the safe sequence possible in the below resource allocation scenario : {Total available resources are $(R_1, R_2, R_3) = (3, 3, 4)$} (CO3)

Proce ss	Max Need			Allocated			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
P_1	7	5	3	0	1	0	3	3	4
P_2	3	2	2	2	0	2			
P_3	9	0	2	3	0	2			
P_4	2	2	2	2	1	1			

4. (a) Explain the contiguous and non-contiguous memory allocation. (CO4)

(b) How many page faults occur for FIFO, LRU and Optimal page replacement algorithm with following reference string for four-page frames :

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2 (CO4)