GYANMANJARI INNOVATIVE UNIVERSITY

Gyanmanjari Institute of Technology

B.Tech.- End Semester Examination (ESE)- Summer - 2026

Enrollment No.:_____ **Date: 13/05/2026**

Subject Code: BETCE14305 **Semester: 4**

Subject Name: Operating System **Total Marks: 100**

Time: 10:30AM To 01:30PM

Instructions:

1. **Question No. 1 is Compulsory.**
2. **Make Suitable Assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

		Marks
Q.1	(a) What is Kernel? Differentiate between Monolithic Kernel and Micro Kernel.	05
	(b) Write different type of system call.	05
	(c) Explain different types of OS and also Explain different types of tasks done by OS.	10
Q.2	(a) What is interrupt? How it is handle by operating system.	05
	(b) Define a process. Explain the process state transition with a neat diagram.	05
	OR	
	(b) What is PCB? Discuss its major fields.	05
	(c) Discuss paging in Detail.	10
	OR	
	(c) Explain SJF, RR and priority CPU scheduling algorithm with proper example.	10
Q.3	(a) Difference between process and thread.	05
	(b) Define and explain following terms: (i) Authentication (ii) Mutual Exclusion (iii) Monitor (iv) Segmentation (v) Thrashing (vi) Thread	05
	(c) Consider the following five processes with the CPU burst time in milliseconds. For the above set of processes find the average waiting time and average around time for each of the following scheduling algorithm using Gantt chart. Consider 1 is highest priority. 1.SJF, 2.Non preemptive Priority, 3.RR (Q = 2	10
	OR	
	(a) What is mutex?	05
	(b) Explain Race Condition regarding banking problem.	05

(c) Consider the processes P1, P2, P3, P4 given in the below table, arrives for execution in the same order, with arrival time 0, and given burst time, draw GANTT chart and find the average waiting time using the FCFS and SJF scheduling algorithm. 10

Q.4 (a) What is Mutex? Write a pseudo code to achieve mutual exclusion using mutex. 05

(b) What is semaphore? 05

(c) Consider the following page reference string: 10
1,2.3,4,5.3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2 With four Frames How many page faults would occur for the FIFO, Optimal page replacement algorithms? which algorithm is efficient? (assume all frames are initially empty)

OR

(a) Write a short note on Critical Section. 05

(b) What is RAG? Explain briefly. 05

(c) Suppose that a disk drive has 200 cylinders. numbered 0 to 199. The drive is currently serving at cylinder 53 and previous request was at cylinder 43. The queue of pending requests in FIFO order is 98, 183, 37, 122, 14, 124, 65, 67 . Starting from the current head position what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of following disk scheduling algorithms. a) FCFS b) SSTF c) SCAN d) LOOK e) C-SCAN f) C-LOOK 10

Q.5 (a) What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented? 05

(b) What are the downsides of using preemptive resource allocation as a deadlock prevention technique in multi-user systems? 05

(c) Explain the use of Banker?s Algorithm for multiple resources for Deadlock Avoidance with illustration. 10

OR

(a) How would system behavior change if the circular wait condition for deadlock was allowed but the hold-and-wait condition was eliminated? 05

(b) Explain the Trojan horse and trap doors program threat 05

(c) Write a Shell Script to find factorial of given number. 10