QP Code: RA22BTECH439 | Reg. No | | | | | | | | | | | AR21/22

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Sixth Semester – Regular/Supplementary) Examinations, April 2025

21BECOE36011 – Operating Systems

(ECE)

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(The figures in the right-hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	What is an operating system? Mention its objectives.	CO1	K1
b.	What is a real time system? Mention any of its two applications.	CO1	K1
c.	Define threads in an operating system.	CO2	K1
d.	Explain transfer look aside buffer.	CO3	K2
e.	Mention the purpose of a directory structure.	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

		Marks	CO #	Blooms Level
	Answer ***all*** the questions			
2. a.	Explain in detail about the objectives and functions of operating systems.	8	CO1	K2
b.	Define essential properties of the following types of Operating system: i) Batch operating system ii) Time sharing operating system	7	CO1	K1
	(OR)			
c.	List out services provided by the Operating Systems?	8	CO1	K1
d.	Explain the various memory hierarchies with neat block diagram	7	CO1	K2
3.a.	What is a critical section problem? Give the conditions that a solution to the critical section problem must satisfy.	8	CO2	K2
b.	Compute average waiting time for the processes using SJF scheduling algorithm and FCFS algorithm.	7	CO2	K3

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4
P5	3	4

(OR)

c.	Describe synchronization hardware and its role in process coordination.	8	CO2	K2
d.	Determine avg. waiting time, avg. turnaround time and avg. response time using Round Robin and shortest remaining time algorithm.	7	CO2	K3

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	2
P4	3	1
P5	4	3
P6	5	2

4.a.	What is demand paging, and how does it affect system performance?	8	CO3	K2
b.	Given page reference string: 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. Compare the number of page faults for LRU and optimal page replacement algorithm.	7	CO3	K4

(OR)

c.	What is deadlock? What are the necessary and sufficient conditions for deadlock to occur in a system?	8	CO3	K2
d.	Given A=10, B=5 and C=7. Using Banker's algorithm, check deadlock is there or not? Also mention the process sequence.	7	CO3	K3

Process	Allocation			Maximum Need			Available			Remaining need		
	A	B	C	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3						
P2	2	0	0	3	2	2						
P3	3	0	2	9	0	2						
P4	2	1	1	4	2	2						
P5	0	0	2	5	3	3						

5.a.	Discuss the concept of the access matrix? Explain implementation of Access matrix in details.	8	CO4	K3
b.	What will be the total head movement if disk queue with request for I/O is in order 98, 153, 37, 122, 14, 124, 65, 67 and uses SSTF disk scheduling algorithm.	7	CO4	K3

(OR)

c.	What is the basic operational difference between SCAN, C-SCAN and LOOK scheduling algorithm.	8	CO4	K2
d.	Write a note on file type and file structure.	7	CO4	K1

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