09 SEP 2025

IN-SEMESTER EXAMINATION-I
TE (Semester-V)
SUBJECT – Operating System

Branch: IT
Div.: ALL
Duration: 60 Minutes

Date: 03/09/2025
Timing: 12:00 PM to 1:00 PM
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	What problem does Peterson's Solution address?	2	3	A
	b.	Discuss the three fundamental requirements that are essential for effectively managing a critical section	2	3	U
	c.	Give the meaning of starvation and aging in process scheduling.	2	2	R
	d.	Explain suspend ready and suspend wait state of a process	2	2	R
	e.	Mention two services provided by an Operating System.	2	1	R
	f.	Draw Process Control Block Diagram	2	1	A
	g.	List & explain any 2 system calls.	2	1	U
Q.2	a.	<table><tr><th>Process Id</th><th>Arrival Time</th><th>Burst Time</th></tr><tr><td>P1</td><td>0</td><td>5</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>2</td><td>2</td></tr><tr><td>P4</td><td>4</td><td>1</td></tr></table> Analyze and Solve the given example using Round Robin algorithm (TQ=2). Calculate the average waiting time and average turnaround time.	5	2	AN
		OR			
	b.	<table><tr><th>Process Id</th><th>Arrival Time</th><th>Burst Time</th></tr><tr><td>P1</td><td>3</td><td>1</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>4</td><td>2</td></tr><tr><td>P4</td><td>0</td><td>6</td></tr><tr><td>P5</td><td>2</td><td>3</td></tr></table> Analyze and Solve the given example using SJF algorithm. Calculate the average waiting time and average turnaround time.	5	2	AN
Q.3	a.	Illustrate Wait and Signal operations in Semaphore.	5	3	A
		OR			
	b.	Propose the solution for Dining philosopher problem using semaphore.	5	3	A

THAKUR COLLEGE OF
ENGINEERING & TECHNOLOGY

TCET/EXAM/FRM/IP-03/06 REVISION : B

IN-SEMESTER EXAMINATION-II

T.E. (Semester-V)

SUBJECT – Operating System

Branch: IT
Div.: ALL
Duration: 60 Minutes
Date: 14/10/2025
Timing: 3:30-4:30PM
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Discuss the role and scope of STBR in segmentation.	2	4	U
	b.	List & define Dynamic Memory allocation Technique	2	4	A
	c.	Explain Different Types of Files ?	2	5	U
	d.	Which file allocation method is appropriate for a long file that is accessed sequentially?	2	5	A
	e.	Explain how a file system organizes data on a mass storage device?	2	6	R
	f.	Define RAID and mention different types of RAID Levels.	2	6	U
	g.	Describe strategy for SCAN Disk Scheduling Algorithm..	2	6	R
Q.2	a.	Draw & Describe Segmentation Hardware with example of Segmentation	5	4	AN
		OR			
	b.	Given free memory partitions of 150 K, 400 K, 250 K, 350 K, and 700 K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 175 K, 300 K, 125 K, and 500 K (in order)?	5	4	A
Q.3	a.	Write the short not on Inode structure.	5	5	U
		OR			
	b.	Illustrate about File. File Operations and it's Attributes.	5	5	A

TCET/EXAM/FRM/IP-03/06 REVISION: B

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END SEMESTER EXAMINATION, NOV 2025
T.E. SEMESTER V (CBCGS-HME 2023)

Branch:	**Information Technology**	**Q.P. Code:**	**E566RN252-2**
Subject:	**Operating System**	**Duration:**	**2 Hours**
Subject Code:	**PCC-IT-501**	**Max. Marks:**	**60**

Instructions: **1. All sections are compulsory**
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary and state the assumptions clearly.

Section-I **Short Answer Questions (Answer any 05 questions out of 06)** **(10 Marks)**

(Fundamental, Core Types)

Q. No.		Marks	CO	RBT Level	PI
1	Write any two examples of system programs.	2	1	R	1.7.1
2	List any two objectives of process scheduling.	2	2	U	2.5.2
3	How would you define the concepts of Mutual Exclusion in the context of concurrent system design?	2	3	A	1.6.1
4	What is Translation look aside buffer? Explain the use of TLB.	2	4	U	1.6.1
5	Which file allocation method is appropriate for a long file that is accessed sequentially?	2	5	A	1.7.1
6	Describe strategy for LOOK Disk Scheduling Algorithm.	2	6	U	1.7.1

Section-II **Descriptive Answer Questions (Answer any 04 out of 06)** **(20 Marks)**

(Descriptive, Comprehension Types)

1	What is the need of distributed operating system?	5	1	U	1.7.1
2	Analyze and Solve the given example using SJF algorithm (Non Preemptive mode). Calculate the average waiting time and average turnaround time.	5	2	AN	2.8.1
3	Total Resources available: A=10, B=5, C=7. Analyze the safe sequence of processes to be executed.	5	3	AN	2.5.3

Process Id	Arrival Time	Burst Time
P1	3	1
P2	1	4
P3	4	2
P4	0	6
P5	2	3

	Allocated			Max		
	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

4	Describe the concept of Virtual Memory and outline the procedure for translating virtual addresses into physical addresses, including a clear diagram.	5	4	A	2.5.3
5	Illustrate different levels of Directory and explain Tree - structure directory with diagram.	5	5	U	1.6.1
6	Explain the roles and functions of the following in an operating system's management of hardware resources: a) Device Controller b) Polling	5	6	R	1.6.1
Section-III	**Long Answer Question (Answer any 03 out of 05) (Application, Analytical, Evaluation, Design Type)**				**(30 Marks)**
1	Define Scheduler. Compare all types of Schedulers with example.	10	2	A	2.6.4
2	Analyze Producer consumer problem solution code using semaphore.	10	3	AN	4.4.2
3	Consider the page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2 with 4 page frames. Find number of page faults using FIFO and LRU page replacement techniques.	10	4	AN	2.5.3
4	What are the common algorithms used for directory implementation in file systems?	10	5	U	1.6.1
5	Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the Previous request was at Cylinder 125. The queue of pending requests, in FIFO order is: 86,1470,913,1774,948,1509,1022,1750,130. 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 the following disk-Scheduling algorithms? a) FCFS b) SSTF c) SCAN	10	6	A	2.5.3