

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

(Decreed to be University)

Anand Nagar, Krishnankoil – 626 126.

END SEMESTER EXAMINATIONS - NOV/DEC 2024

Course Code	: 212CSE2303	Duration	: 180 Minutes
Course Name	: Software Engineering	Max. Marks	: 100
Degree	: B.Tech.		

PART – A (20 Marks) Answer All Questions		Pattern	Mapping COs	Marks
1	List the five activities in the Generic Process Framework	Analyze	CO1	2.0
2	Discuss the term Project Management Concepts	Understand	CO1	2.0
3	What is SSD?	Remember	CO2	2.0
4	What is the Elaboration phase in software development?	Remember	CO2	2.0
5	What is modularity in design and why is it important?	Understand	CO3	2.0
6	List any two design concepts important for creating scalable software.	Remember	CO3	2.0
7	What is static and dynamic testing?	Understand	CO4	2.0
8	What are the roles of cyclomatic complexity value in software testing?	Understand	CO4	2.0
9	Write notes on the structure of CASE REPOSITORY .	Remember	CO5	2.0
10	Write short notes on empirical estimation models.	Understand	CO5	2.0

PART – B (80 Marks) Answer All Questions		Pattern	Mapping COs	Marks
11.A	Describe the significance of Waterfall model and Iterative Model in software development process	Understand	CO1	16.0
OR				
11.B	Why Software Engineering? What are the crisis and solutions of software engineering?	Understand	CO1	16.0
12.A	Explain the numbering system used in a collaboration diagram to represent the order of messages. How does this aid in understanding the system flow?	Understand	CO2	16.0
OR				
12.B	Describe the steps involved in creating a System Sequence Diagram (SSD) for an online exam system. Include examples of system events and operations	Apply	CO2	16.0
13.A	Describe the design procedure for a data acquisition system in detail with examples.	Apply	CO3	16.0

PART – B (80 Marks) Answer All Questions			Pattern	Mapping COs	Marks
OR					
13.B	Design a state diagram for a student registration system, illustrating stages such as "Registered," "Course Selection," "Fee Payment," and "Registration Complete." Describe the flow and transitions between states.		Apply	CO3	16.0
14.A	Discuss the challenges and strategies involved in testing for special environments like embedded systems, mobile devices, or cloud platforms. How do these environments affect the testing process?		Understand	CO4	16.0
OR					
14.B	Explain Data Flow Testing and its significance with an example and how does it help in identifying issues in code?		Understand	CO4	16.0
15.A	Explain How the Single Responsibility Principle (SRP) Relates to Cohesion in Object-Oriented Systems.		Understand	CO5	16.0
OR					
15.B	Discuss the advantages of using frameworks in software development. Provide examples of popular frameworks used in different domains.		Analyze	CO5	16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	0	34.0	0	2.0	0	0	36
CO2	4.0	16.0	16.0	0	0	0	36
CO3	2.0	2.0	32.0	0	0	0	36
CO4	0	36.0	0	0	0	0	36
CO5	2.0	18.0	0	16.0	0	0	36
Total	8	106	48	18	0	0	180

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KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

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SESSIONAL EXAMINATION – I– ODD SEMESTER
[2024-2025]

Course Name/Code	SOFTWARE ENGINEERING/ 212CSE2303	Date & Session	:	29.08.2024 / FN
Degree/Branch	B.Tech/CSE	Duration	:	90 Minutes
Semester/Section	V	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:						
Remember	Understand	Apply	Analyze	Evaluate	Create	Total
12	26	10	2	-	-	50

Course Outcomes for Assessment in this Test:

Cos	Course Outcome
CO1	Create a list of use cases, classes, objects out of the given problem summary
CO2	Develop the steps in each phase of the software development model

PART – A (5 x 2 = 10 Marks)		Pattern	Mapping Cos	Marks
Answer All Questions				
1.	Implement Why “Software process assessment” is essential in software process model?	Apply	CO1	2
2.	List three kinds of actors in a use case?	Remember	CO1	2
3.	Compare and contrast between increment and iterative model.	Understand	CO1	2
4.	Examine the main objectives of the elaboration phase?	Analyze	CO2	2
5.	Define UML and its uses?	Remember	CO2	2

PART – B (5x8=40)		Pattern	Mapping Cos	Marks
Answer All Questions				
6.	Demonstrate WHSS's principles.	Apply	CO1	8
7.	Explain the Water fall model. What issues arise occasionally when applying the waterfall model?	Understand	CO1	8
8.	Explain briefly the three common formats of USE CASE.	Understand	CO1	8
9.	Explain the use-case diagram for the ATM.	Understand	CO2	8
10.	Describe the collaborative diagram for online shopping, which should include provisions for registering, authenticating customers, and online payment through any payment gateway, such as PayPal.	Remember	CO2	8

Assessment Summary:							
Cos	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	18	10	0	-	-	30
CO2	10	8	0	2	-	-	20

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SESSIONAL EXAMINATION – II– ODD SEMESTER [2023-2024]

Course Name/Code	Software Engineering/ 212CSE2303	Date & Session	11.10.2023 & FN
Degree/Branch	B.Tech./CSE	Duration	90 Minutes
Semester/Section	V/CBCS	Max. Marks	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
24	26	0	0	0	0	50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO3	Apply the given UML tool on identified models.
CO4	Verify the deliverables of the model with sample inputs.

PART – A (5 x 2 = 10 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
1.	What is meant by Architectural Design?	Remember	CO3	2
2.	Define User Interface and list its types.	Remember	CO3	2
3.	When to use a State Machine Diagram?	Remember	CO3	2
4.	What is meant by Software Testing?	Remember	CO4	2
5.	Compare and Contrast between White and Black box testing.	Understand	CO4	2

PART – B (40 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
6.	Explain briefly the principles of Software Design?	Understand	CO3	8
7.	What is meant by Architectural Styles? Explain the various styles in detail	Remember	CO3	16
8.	Explain Unit Testing in detail? Also state its advantages and disadvantages over other testing techniques.	Understand	CO4	16

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3	22	8	0	0	0	0	30
CO4	2	18	0	0	0	0	20

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SESSIONAL EXAMINATION – II– ODD SEMESTER [2024-2025]

Course Code	212CSE2303	Date & Session	:	23.10.2024/FN
Course Name	Software Engineering	Duration	:	90 Minutes
Degree/Branch	B.Tech/CSE	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
04	18	08	12	-	8	50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO3	Apply the given UML tool on identified models
CO4	Verify the deliverables of the model with sample inputs

PART – A (5 x 2 = 10 Marks) Answer All Questions		Pattern	Mapping COs	Marks
1. What is software architecture?		Remember	CO3	2
2. How do you describe a software interface?		Understand	CO3	2
3. Distinguish between hard and soft real-time systems		Analyze	CO3	2
4. What is static and dynamic testing?		Remember	CO4	2
5. Distinguish between black and white box testing		Analyze	CO4	2
PART – B (5x8=40 Marks) Answer All Questions		Pattern	Mapping COs	Marks
6. Discuss in detail about the design process in the software development process		Understand	CO3	8
7. Explain the importance of user interface design in the sale of software		Understand	CO3	8
8. Design a state diagram for an online exam system		Create	CO3	8
9. You are part of a software development team creating a travel booking application that allows users to search for flights, book tickets, and manage their itineraries. As the application grows in complexity, the team encounters several bugs related to the booking logic, particularly when handling different fare types and discounts. Explain the best practices for conducting effective unit tests in a software development project.		Apply	CO4	8
10. Examine the challenges and strategies involved in testing for special environments like embedded systems, mobile devices, or cloud platforms. How do these environments affect the testing process?		Analyze	CO4	8

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3	02	10	08	02	-	08	30
CO4	-	02	08	10	-	-	20

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END SEMESTER EXAMINATIONS - NOV/DEC 2023

Course Code	: 212CSE3303	Duration	: 180 Minutes
Course Name	: Operating Systems	Max. Marks	: 100
Degree	: B.Tech.		

**PART – A (20 Marks)
Answer All Questions**

		Pattern	Mapping COs	Marks
1	What are the main advantages of multiprocessor systems?	Remember	CO1	2.0
2	Differentiate single-threaded and multi-threaded processes	Analyze	CO1	2.0
3	State the primary distinction between short-term and long-term schedulers.	Analyze	CO2	2.0
4	Name and draw different process states with proper definitions.	Remember	CO2	2.0
5	Elucidate mutex locks with its procedure.	Understand	CO3	2.0
6	Comment on co-operative processes	Remember	CO3	2.0
7	Consider a memory system with a cache access time of 10ns and a memory access time of 110ns - assume the memory access time includes the time to check the cache. If the effective access time is 10% greater than the cache access time, what is the hit ratio?	Apply	CO4	2.0
8	Will the optimal page replacement algorithm suffer from Belady's anomaly? Justify your answer.	Analyze	CO4	2.0
9	Differentiate between file and directory.	Analyze	CO5	2.0
10	Suppose that the disk rotates at 7200 rpm. What is the average rotational latency of the disk drive?	Apply	CO5	2.0

**PART – B (80 Marks)
Answer All Questions**

		Pattern	Mapping COs	Marks
11.A	What are system calls? How do system calls help user programs to interact with this OS? Explain.	Understand	CO1	16.0
OR				
11.B	Illustrate the features of the following types of operating system structure i) MS-DOS layer structure ii) Layered approach iii) Microkernel system structure iv) Monolithic kernel	Understand	CO1	16.0

PART – B (80 Marks)
Answer All Questions

Pattern Mapping COs Marks

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- 12.A Assume some OS needs to schedule four processes using different scheduling algorithms. For each process, the following information shows its burst time (processing time), priority (the lower number, the higher the priority) and arrival time.

Processes	Burst time	Priority	Arrival time
P1	12	3	0
P2	6	4	2
P3	4	1	4
P4	18	2	6

What is the average waiting time of those processes for each of the following schedule algorithms? (Draw a Gantt chart for each algorithm.)

- i) First Come First Serve
- ii) Non-preemptive Shortest Job First
- iii) Priority scheduling (preemptive)
- iv) Preemptive Shortest Job First

OR

- 12.B i) Consider the process model, the operating system creates a data structure called PCB. By using this data structure, the user can get all the details of the processes. List out all the information contained in PCB.
- ii) Process P1 needs to send a message to P2. Is it possible to send a message? and Also Justify your answer with the appropriate concept.
- iii) A thread refers to a single sequential flow of activities being executed in a process; it is also known as the thread of execution. Explain its states with a neat sketch.

Apply CO2 16.0

- 13.A i) The Problem states that K philosophers are seated around a circular table with one chopstick between each pair of philosophers. There is one chopstick between each philosopher. A philosopher may eat if he can pick up the two chopsticks adjacent to him. One chopstick may be picked up by any one of its adjacent followers but not both. What is the meaning of the critical section? How will you solve this problem?
- ii) Consider a situation where we have a file shared between many people. If one of the people tries editing the file, no other person should be reading or writing at the same time, otherwise changes will not be visible to him/her. However, if some person is reading the file, then others may read it at the same time. How will you allow the user to access the file?

Apply CO3 16.0

OR

PART – B (80 Marks)
Answer All Questions

Pattern Mapping COs Marks

- 13.B Consider the following system snapshot using data structures in the Banker's algorithm, with resources A, B and C.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	2	4	3	3			

Using Banker's algorithm, answer the following questions

- i) What are the contents of the need matrix?
- ii) Find if the system is in a safe state. If it is, find the safe sequence
- iii) Suppose the P₁ requests one additional instance of resource type A and 2 instances of C, What will happen?

- 14.A Segmentation works wonders in memory management as if giving every process a private penthouse with a view. It allows processes to have exclusive address space, shielding them from interfering with others. Draw the diagram of the segmentation memory management scheme and Analyze its principle.

OR

- 14.B When do page faults occur? consider the reference string: 1,2,3,4,2|1,5,6,2,1|2,3,7,6,3,2,1,2,3,6. how many page faults and page fault rate (miss ratio) occur for the FIFO, LRU and Optimal page replacement algorithms, Assuming three page frames?

- 15.A i) In some systems, a file can be read and written by an authorized user, Evaluate the file protection mechanism with your justifications.
ii) Consider a file system where a file can be deleted and its disk space reclaimed while links to that file still exist. What problems may occur? and Evaluate the allocation methods of the file.

OR

- 15.B Consider a disk queue with requests for I/O to blocks on cylinders 98; 183, 37, 122, 14, 124, 65, and 67. If the disk head starts at 53, then find out the total head movement with respect to FCFS, SSTF, SCAN, C-SCAN and LOOK scheduling.

Analyze CO4 16.0

Analyze CO4 16.0

Evaluate CO5 16.0

Evaluate CO5 16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2.0	32.0	0	2.0	0	0	36
CO2	2.0	0	32.0	2.0	0	0	36
CO3	2.0	2.0	32.0	0	0	0	36
CO4	0	0	2.0	34.0	0	0	36
CO5	0	0	2.0	2.0	32.0	0	36
Total	6	34	68	40	32	0	180

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END SEMESTER EXAMINATIONS - NOV/DEC 2024

Course Code	:	212CSE3303	Duration	:	180 Minutes
Course Name	:	Operating Systems	Max. Marks	:	100
Degree	:	B.Tech.			

PART – A (20 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
1	What are the activities of the operating system regarding file management?	Remember	CO1	2.0
2	What is called by resource allocation	Remember	CO1	2.0
3	Write down the formula for TAT and WT.	Analyze	CO2	2.0
4	What is a thread?	Understand	CO2	2.0
5	Define race condition.	Remember	CO3	2.0
6	What is meant by Co-operating process?	Remember	CO3	2.0
7	What are the differences between Logical and physical address?	Remember	CO4	2.0
8	Define lazy swapper.	Understand	CO4	2.0
9	What are the components of I/O devices.	Remember	CO5	2.0
10	What is the main use of Access Matrix?	Remember	CO5	2.0

PART – B (80 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
11.A	What is real time operating system? List the types. "Operating system is broker between computer System and User" and OS as a Resource Manager Justify the statements?	Evaluate	CO1	16.0

OR

11.B	How does context switch work during a system call?	Remember	CO1	16.0
12.A	Explain the following process scheduling algorithm A) Shortest job first scheduling with example. B) Discuss the Advantages and disadvantages of SJF.	Understand	CO2	16.0

OR

12.B	Explain Multithreading Models with neat diagram. discuss the advantages and disadvantages of each model.	Remember	CO2	16.0
13.A	What are conditions under which a deadlock situation may arise? Explain each condition in detail.	Remember	CO3	16.0

OR

PART - B (80 Marks) Answer All Questions			Pattern	Mapping COs	Marks
13.B	Describe the critical section conditions and how it can be handled by process synchronization.	Analyze	CO3	16.0	
14.A	A system uses 3 page frames for storing process pages in main memory. It uses the First in First out (FIFO) and LRU page replacement policies. Assume that all the page frames are initially empty. What is the total number of page faults that will occur while processing the page reference string given below- 4 , 7, 6, 1, 7, 6, 1, 2, 7, 2 Also calculate the hit ratio and miss ratio.	Apply	CO4	16.0	
OR					
14.B	What is a Dirty Page and Dirty Bit? Explain its role in virtual memory management.	Remember	CO4	16.0	
15.A	Discuss in detail about Direct Memory Access (DMA) with neat sketch.	Remember	CO5	16.0	
OR					
15.B	What are all the File Access Mechanisms explain in detail about each method.	Understand	CO5	16.0	

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	20.0	0	0	0	16.0	0	36
CO2	16.0	18.0	0	2.0	0	0	36
CO3	20.0	0	0	16.0	0	0	36
CO4	18.0	2.0	16.0	0	0	0	36
CO5	20.0	16.0	0	0	0	0	36
Total	94	36	16	18	16	0	180

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SESSIONAL EXAMINATION – II – ODD SEMESTER

[2024-2025]

Course Name/Code	212CSE3303/Operating Systems	Date & Session	:	22.10.2024/AN
Degree/Branch	B.Tech(CSE)	Duration	:	90 Minutes
Semester/Section	V	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
6	26	16	2			50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO3	Apply different methods for handling deadlocks and elaborate process synchronization.
CO4	Analyze the efficiency of various page replacement algorithms for memory management.

PART – A (5 x 2 = 10 Marks)		Pattern	Mapping COs	Marks
Answer All Questions				
1. Define co-operating process and independent process.	Remember	CO3	2	
2. What are the requirements of solving the critical-section problem?	Understand	CO3	2	
3. How can we prevent the occurrence of a deadlock?	Remember	CO3	2	
4. What are the differences between First-fit placement and best-fit placement?	Analyze	CO4	2	
5. What is the demand paging?	Remember	CO4	2	

PART – B (5x8=40)		Pattern	Mapping COs	Marks
Answer All Questions				
6. Discuss in detail about Producer-Consumer problem using Semaphores.	Understand	CO3	8	
7. Consider we have five processes P0, P1, . . . , P5 and three resources A, B, and C. Is executing the following processes in the safe state?	Apply	CO3	8	

Process	Allocation			Maximum need			Available					
	A	B	C	A	B	C	A	B	C			
P0	1	2	0	2	2	2	0	1	0			
P1	1	0	0	1	1	0						
P2	1	1	1	1	4	3						
P3	0	1	1	1	1	1						
P4	0	0	1	1	2	2						
P5	1	0	0	1	5	1						

8. Consider the following page reference using four frames that are initially empty. Find the page faults using LRU algorithm, where the page reference sequence: 5,2,5,1,4,5,2,0,4,2,3,1,2,1,0,0,2,4,5,1
 9. Discuss in detail about memory management techniques.

Apply	CO4	8
Understand	CO4	16

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3	4	10	8				22
CO4	2	16	8	2			28

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SESSIONAL EXAMINATION – I– ODD SEMESTER [2023-2024]

Course Name/Code	OPERATING SYSTEMS/212CSE3303	Date & Session	:	23.08.2023 AN
Degree/Branch	B.TECH /CSE	Duration	:	90 Minutes
Semester/Section	V	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
10	20	16	4			50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO1	Understand and Interpret Operating System Structure, Operations, Services and Process.
CO2	Apply various scheduling algorithms for Process/CPU Scheduling and elaborate multithreaded programming.

PART – A (5 x 2 = 10 Marks)

Answer All Questions

1. State the convey effect in operating system	Pattern	Mapping COs	Marks
2. Differentiate kernel mode with user mode	Remember	CO1	(2)
3. Recall the term "throughput"	Analyze	CO1	(2)
4. What is a process?	Understand	CO2	(2)
5. Why is the Operating System viewed as a resource allocator & control program?	Understand	CO2	(2)

PART – B (5x8=40)

Answer All Questions

6. Explain the various types of operating system.	Pattern	Mapping COs	Marks																		
7. Consider the set of 5 processes whose arrival time and burst time are given below-	Understand	CO1	8																		
<table border="1"> <tr> <th>Process Id</th> <th>Arrival Time</th> <th>Burst Time</th> </tr> <tr> <td>P1</td> <td>3</td> <td>4 3</td> </tr> <tr> <td>P2</td> <td>5</td> <td>3</td> </tr> <tr> <td>P3</td> <td>0</td> <td>2</td> </tr> <tr> <td>P4</td> <td>5</td> <td>1</td> </tr> <tr> <td>P5</td> <td>4</td> <td>3</td> </tr> </table>	Process Id	Arrival Time	Burst Time	P1	3	4 3	P2	5	3	P3	0	2	P4	5	1	P5	4	3	Apply	CO2	8
Process Id	Arrival Time	Burst Time																			
P1	3	4 3																			
P2	5	3																			
P3	0	2																			
P4	5	1																			
P5	4	3																			

If the CPU scheduling policy is SJF- pre-emptive, calculate the average waiting time and average turn around time.

8. Describe the working principles of round robin scheduling algorithm and calculate average turn around time and waiting time for the following processes,

Consider time quantum =2ms

Process Id	Arrival Time	Burst Time
P1	2	4
P2	1	3
P3	3	5

9. Discuss the process states with a neat sketch.

10. Illustrate the Operating system structures.

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	16		4			22
CO2	8	4	16				28

3) 13 (4.3)
 3) 12 (10.2)
 3) 25 (8.3)
 3) 24 (10)
 3) 20 (4.0)
 11 5
 5) 11 (2.2)
 5) 10 (1.0)
 5) 0 (0.0)



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SESSIONAL EXAMINATION – I – ODD SEMESTER [2024-2025]

Course Name/Code	OPERATING SYSTEMS/212CSE3303	Date & Session :	31.08.2024/FN
Degree/Branch	B. TECH /CSE	Duration :	90 Minutes
Semester/Section	V	Max. Marks	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
2	22	16	10			50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO1	Understand and Interpret Operating System Structure, Operations, Services and Process.
CO2	Apply various scheduling algorithms for Process/CPU Scheduling and elaborate multithreaded programming.

PART – A (5 x 2 = 10 Marks)

Answer All Questions

- | | | | |
|--|------------|-----|---|
| 1. Define an Operating System. | Understand | CO1 | 2 |
| 2. List out the types of networks based operating systems. | Remember | CO1 | 2 |
| 3. Distinguish between multiprogramming and multitasking. | Understand | CO1 | 2 |
| 4. Explore some of the states of processes. | Understand | CO2 | 2 |
| 5. Analyze the structure and function of a PCB. | Analyze | CO2 | 2 |

PART – B (5x8=40)

Answer All Questions

- | | | | |
|--|------------|-----|---|
| 6. Explain the various types of operating system. | Understand | CO1 | 8 |
| 7. Describe the operating system structures. | Understand | CO1 | 8 |
| 8. Analyze the potential drawbacks of using a layered approach in system design. What specific challenges or limitations might occur when applying this design strategy? | Analyze | CO2 | 8 |
| 9. Consider the set of 5 processes whose arrival time and burst time are given below- | Apply | CO2 | 8 |

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

If the CPU scheduling policy is SJF- preemptive, calculate the average waiting time and average turnaround time.

10.	Describe the working principles of round robin scheduling algorithm and calculate average turnaround time and waiting time for the following processes. Consider time quantum =2ms	Apply	CO2	8												
	<table border="1"> <thead> <tr> <th>Process Id</th> <th>Arrival Time</th> <th>Burst Time</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>2</td> <td>4</td> </tr> <tr> <td>P2</td> <td>1</td> <td>3</td> </tr> <tr> <td>P3</td> <td>3</td> <td>5</td> </tr> </tbody> </table>	Process Id	Arrival Time	Burst Time	P1	2	4	P2	1	3	P3	3	5			
Process Id	Arrival Time	Burst Time														
P1	2	4														
P2	1	3														
P3	3	5														

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	20					22
CO2		2	16	10			28

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KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

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END SEMESTER EXAMINATIONS, APR/MAY 2025

212CSE3302 -Computer Networks
(Common To All Sections)

Time : 180Minutes	Degree: B.Tech.	Maximum : 100 Marks
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(Answer ALL Questions of PART A and PART B)

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
12	102	34	32	0	0	180

PART – A (10 × 2 = 20 Marks)

		Pattern	Mapping COs	Marks
1.	Differentiate Circuit-switched networks and Packet-switched networks.	Understand	CO1	2.0
2.	List the various transmission media used in networking.	Remember	CO1	2.0
3.	List out the functions of the Data Link Layer	Remember	CO2	2.0
4.	Suppose two computers are connected by an Ethernet hub at home. Is this a LAN, a MAN, or a WAN?	Understand	CO2	2.0
5.	State the function of ICMPv4 protocol.	Remember	CO3	2.0
6.	Identify the address class of the following IP addresses (a) 200.58.20.165 (b) 128.167.23.20	Apply	CO3	2.0
7.	What would be preferable over other (TCP/UDP), (a) Streaming a live video over the internet TCP/UDP (b) Large file transfers TCP/UDP	Remember	CO4	2.0
8.	Identify the services provided by UDP.	Remember	CO4	2.0
9.	List out the types of DNS servers supported by the network.	Remember	CO5	2.0
10.	What is the difference between IMAP and POP?	Understand	CO5	2.0

PART – B (5 × 16 = 80 Marks)

		Pattern	Mapping COs	Marks
11a	Illustrate the four important and essential types of physical topology or network topology that helps to perform the device linking geographical.	Understand	CO1	16.0
	[OR]			
11b	What are the layers of the ISO/OSI protocol stack? Briefly list out their functions.	Understand	CO1	16.0
12a	Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single-bit errors? Assuming an even parity show the bit pattern transmitted for the message 1101001100110101. How the receiver does finds whether the received code word has an error or not.	Apply	CO2	16.0
	[OR]			
12b	What is wireless communication? List out some wireless technologies available. Compare the characteristics of the various wireless 802.11 standards	Understand	CO2	16.0
13a	Illustrate the working principles of IPV4 addressing and also elaborate IPV6 address shorthand with an example.	Understand	CO3	16.0

	[OR]			
13b	An ISP is given a block of addresses beginning with 190.100.0.0/16. The ISP needs to distribute these addresses to 3 groups of customers as follows: a) Group 1 has 64 customers each needs 256 addresses. b) Group 2 has 128 customers each needs 128 addresses. c) Group 3 has 128 customers each needs 64 addresses. Design the sub-blocks and give the slash notation for each sub-block. How many addresses are still available after these allocations?	Apply	CO3	16.0
14a	What are the two broad categories of Congestion Control mechanisms? Briefly explain all the techniques.	Understand	CO4	16.0
	[OR]			
14b	Imagine a Go-Back-N protocol operating over a wireless network with a highly variable bit error rate (BER). The sender is transmitting data to a receiver located in a moving vehicle. The wireless channel experiences frequent bursts of interference, leading to intermittent packet loss. The network's round-trip time (RTT) fluctuates significantly, ranging from 50ms to 500ms. The sender has a fixed window size of 8 packets. Describe how the Go-Back-N protocol will behave when a burst of interference causes packets 3, 4, and 5 to be lost in transmission. Detail the sequence of events at both the sender and receiver.	Analyze	CO4	16.0
15a	Discuss the architecture of WWW and describe the concepts of hypertext and hypermedia	Understand	CO5	16.0
	[OR]			
15b	You have just joined a new company and need to configure your email client to send and receive emails using the company's email server. What information do you need to include in the email header to ensure that your emails are delivered correctly? How does the Mail Transfer Agent (MTA) play a role in routing your emails to the correct recipient?	Analyze	CO5	16.0

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	34	0	0	0	0	36
CO2	2	18	16	0	0	0	36
CO3	2	16	18	0	0	0	36
CO4	4	16	0	16	0	0	36
CO5	2	18	0	16	0	0	36
TOTAL	12	102	34	32	0	0	180

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

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SESSIONAL EXAMINATION - I/II - MAR 2025

Course Code	: 212CSE3302	Duration	: 90 Minutes
Course Name	: Computer Networks	Max. Marks	: 50
Degree	: B.Tech.	Date & Session	: 19-03-2025 / FN

PART – A (10 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
1	State the purpose of private addressing. List out its range.	Understand	CO3	2.0
2	State the meaning of count-to-infinite problem.	Understand	CO3	2.0
3	Given an IP address 192.168.1.0/24, divide it into four subnets using VLSM.	Apply	CO3	2.0
4	Suppose a TCP connection is transferring a file of 3000 bytes. The first byte is numbered 10001. What are the sequence numbers for each segment if data are sent in three segments, each carrying 1000 bytes.	Analyze	CO4	2.0
5	DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem, and if so, how it is solved?	Analyze	CO4	2.0

PART – B (40 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
6	A company has been assigned the network 192.168.1.0/24. They need 5 subnets, each supporting 40 hosts. Which subnet mask should they use? Calculate the network and broadcast addresses for the third and fifth subnet.	Apply	CO3	8.0
7	To implement the distance routing algorithm in the given network, also find the shortest path from each node.	Analyze	CO3	16.0
8	What is congestion control? Provide a detailed explanation of the congestion control mechanisms used in the transport layer.	Understand	CO4	16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3	0	4.0	10.0	16.0	0	0	30
CO4	0	16.0	0	4.0	0	0	20
Total	0	20	10	20	0	0	50

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SESSIONAL EXAMINATION - I - JAN 2025

Course Code	: 212CSE3302	Duration	: 90 Minutes
Course Name	: Computer Networks	Max. Marks	: 50
Degree	: B.Tech.	Date & Session	: 22-01-2025 / FN

PART – A (10 Marks) Answer All Questions		Pattern	Mapping COs	Marks
1	Define. Computer Networks.	Remember	CO1	2.0
2	List out various transmission topologies.	Understand	CO1	2.0
3	State the importance of transmission media and write down it's major classification.	Remember	CO1	2.0
4	List out the design issues in DLL.	Remember	CO2	2.0
5	State the purpose of using Hamming code.	Analyze	CO2	2.0

PART – B (40 Marks) Answer All Questions		Pattern	Mapping COs	Marks
6	Explain in detail the TCP/IP protocol suite with a neat diagram.	Apply	CO1	8.0
7	With the OSI reference architecture diagram, explain the functionalities of each layer in detail.	Remember	CO1	16.0
8	Illustrate the various types of error. Discuss the various types of detection and correction.	Understand	CO2	16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	20.0	2.0	8.0	0	0	0	30
CO2	2.0	16.0	0	2.0	0	0	20
Total	22	18	8	2	0	0	50

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SESSIONAL EXAMINATION – II / EVEN SEMESTER [2023-2024]

Course Name/Code	212CSE3302 – Computer Networks	Date & Session	:	08.03.2024 11.15AM – 12.45 PM
Degree/Branch	B.Tech. CSE	Duration	:	90 Minutes
Semester/Section	VI / All	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
4	10	20	16	-	-	50

Course Outcomes for Assessment in this Test:

Cos	Course Outcome
CO3	Apply various routing protocols to select optimal path and relate addressing entities in Network layer
CO4	Analyze the various security protocols at different layers of OSI architecture

PART – A

Answer All Questions

1. Differentiate Adaptive routing with Non Adaptive routing algorithms.
2. A router receives a packet with the destination address 101.85.54.42. Find the network & broadcast address of the packet.
3. Expand the address 20:15::1:12:1213 to its original.
4. List the different phases used in TCP connection.
5. Name the types and range of port numbers used in transport layer.

PART – B

Answer All Questions

6. Elaborate the key design issues in the Network Layer of a communication system, and elaborate how do they impact the overall performance and reliability of data transmission?
7. a. Calculate the new routing table for node C using distance vector routing.
- b. Calculate the Network ID, Broadcast Address, First usable IP and Last usable IP on the subnet that the node 192.168.1.15/26 belongs to? What if /25 is used?
8. Identify and analyze the various duties of the Transport Layer.

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3	-	10	20	-	-	-	30
CO4	4	-	-	16	-	-	20

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Kalasalingam Academy of Research and Education (Deemed to be University) Anand Nagar, Krishnankoil – 626 126. SESSIONAL EXAMINATION – I / EVEN SEMESTER [2023-2024]							
Course Name/Code	212CSE3302 – Computer Networks			Date & Session	:	23.01.2024 11.15AM – 12.45 PM	
Degree/Branch	B.Tech. CSE			Duration	:	90 Minutes	
Year/Semester/Section	III / VI / All			Max. Marks	:	50 Marks	
Assessment Pattern as per Bloom's Taxonomy:							
Remember	Understand	Apply	Analyze	Evaluate	Create	Total	
2	20	10	18	-	-	50	
Course Outcomes for Assessment in this Test:							
Cos	Course Outcome						
CO1	Understand the basics of data communication and various categories of networks and its operations.						
CO2	Identify the technologies for error free secure transmission of data in data link layer.						
PART – A (5 x 2 = 10 Marks) Answer All Questions				Pattern	Mapping COs		
1. List out the service primitives that provide a simple connection-oriented service.				Understand	CO1	2	
2. Define the term Byte count method.				Remember	CO1	2	
3. We have a message that we want to transmit: 11011001. Calculate the redundant bits to generate hamming code.				Apply	CO2	2	
4. Examine the term Piggybacking.				Understand	CO2	2	
5. Relate persistent CSMA with non-persistent CSMA.				Analyze	CO2	2	
PART – B Answer All Questions				Pattern	Mapping COs		
6. Describe briefly the various layers and functions of OSI model and compare OSI Model with TCP/IP model.				Understand	CO1	16	
7. Identify the key design issues in the Data Link Layer of a communication system, and elaborate how do they impact the overall performance and reliability of data transmission?				Analyze	CO2	16	
8. A bit stream 10011101 is transmitted using the standard CRS method. The generator polynomial is $x^3 + 1$.				Apply	CO2	8	
a. What is the actual bit string transmitted? b. Suppose the third bit from the left is inverted during transmission. How will the receiver detect this error?							
Assessment Summary:							
COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	18	2	-	-	-	22
CO2	-	2	8	18	-	-	28

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END SEMESTER EXAMINATIONS - NOV/DEC 2024

Course Code	: 212CSE3301	Duration	: 180 Minutes
Course Name	: Design and Analysis of Algorithms	Max. Marks	: 100
Degree	: B.Tech.		

PART – A (20 Marks)
Answer All Questions

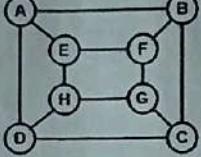
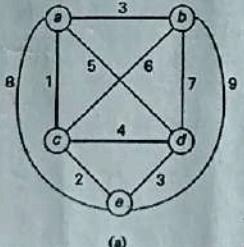
		Pattern	Mapping COs	Marks
1	Define Algorithms.	Remember	CO1	2.0
2	Find the Time complexity for the following code <code>int i, j, k = 0; for (i = n / 2; i <= n; i++) { for (j = 2; j <= n; j = j * 2) { k = k + n / 2; } }</code>	Analyze	CO1	2.0
3	What is the Divide and Conquer technique? List 2 examples	Remember	CO2	2.0
4	Define LCS problem	Remember	CO2	2.0
5	Define state space tree	Remember	CO3	2.0
6	List out the characteristics of Heuristics algorithm	Remember	CO3	2.0
7	Compare Karp reduction and Turing reduction	Understand	CO4	2.0
8	What is knapsack problem and write its time complexity ?	Understand	CO3	2.0
9	How does First-Fit bin packing work?	Understand	CO5	2.0
10	Define Randomized algorithm	Remember	CO5	2.0

PART – B (80 Marks)
Answer All Questions

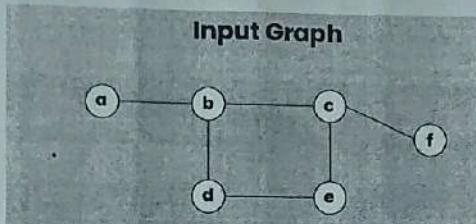
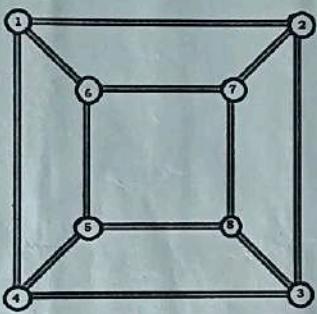
		Pattern	Mapping COs	Marks
11.A	(i) Solve recursive function of Fibonacci Numbers using Substitution Method. $F(n)=F(n-1)+F(n-2)$	Apply	CO1	8.0
	(ii) Solve GCD of (74,24) using following 3 methods. <ul style="list-style-type: none"> • Euclid's Method • Using Consecutive Integers • Middle School Procedure 	Apply	CO1	8.0

OR

11.B	Apply backward substitution method for Tower of Hanoi problem and analyze its time complexity in detail	Apply	CO1	16.0
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PART – B (80 Marks) Answer All Questions		Pattern	Mapping COs	Marks
12.A	Explain the Karatsuba algorithm using the Divide and Conquer method in detail and solve the problem for the following values. $x=1234$ and $y=5678$	Apply	CO2	16.0
OR				
12.B	Explain OBST algorithm using dynamic programming, solve the following values and analyze its complexity Keys : { Apple, Banana, Carrot and Lemon } with frequencies { 4,2,6,3 }	Apply	CO2	16.0
13.A	i) Apply backtracking technique to find the hamiltonian path from the following graph  ii) Apply backtracking technique to solve the following subset sum problem $S = \{ 3,5,6,8,9,11 \}$ and $N = 17$	Apply	CO3	16.0
OR				
13.B	Explain the TSP problem using branch and bound technique and Find the shortest path from the given graph (a is the strating vertex)	Apply	CO3	16.0
	 (a)			
14.A	i) Explain Cooks Theorem with SAT problem ii) Discuss in detail about Clique Decision problem	Understand	CO4	16.0
OR				
14.B	Explain complexity classes in detail with suitable examples.	Understand	CO4	16.0

Marks
16.0
16.0
16.0
16.0
16.0

PART – B (80 Marks) Answer All Questions				Pattern	Mapping COs	Marks
15.A	Solve and find the minimum subset which covers all vertices using Vertex cover Problem. i)			Apply	CO5	16.0
	 Input Graph <pre> graph LR a((a)) --- b((b)) b --- c((c)) c --- f((f)) b --- d((d)) d --- e((e)) e --- c </pre> ii)  <pre> graph TD 1((1)) --- 2((2)) 2 --- 3((3)) 3 --- 4((4)) 4 --- 1 1 --- 5((5)) 5 --- 6((6)) 6 --- 7((7)) 7 --- 2 5 --- 8((8)) 8 --- 9((9)) 9 --- 10((10)) 10 --- 5 </pre>					
	OR					
15.B	Apply approximation algorithm to solve the Traveling Salesman problem with examples			Apply	CO5	16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2.0	0	32.0	2.0	0	0	36
CO2	4.0	0	32.0	0	0	0	36
CO3	4.0	2.0	32.0	0	0	0	38
CO4	0	34.0	0	0	0	0	34
CO5	2.0	2.0	32.0	0	0	0	36
Total	12	38	128	2	0	0	180

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SESSIONAL EXAMINATION – I – ODD SEMESTER [2023-2024]

Course Name/Code	Design and Analysis of Algorithm / 212CSE3301	Date & Session	:	31.08.24/AN
Degree/Branch	B.Tech /CSE	Duration	:	90 Minutes
Semester/Section	V Sem. / (all CSE sections)	Max. Marks	:	50 Marks

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO1	Understand the characteristics and types of algorithms and use asymptotic notations to analyze the performance of algorithms
CO2	Analyze the differences in design techniques and apply Greedy and Dynamic Programming strategies to solve Optimization problems

PART – A (5 x 2 = 10 Marks)

Answer All Questions

1. What is Time-Space trade-off.	Understand	CO1	2															
2. Find the time complexity of following code. for(i=0; i<n ;i*2) { Print(i); }	Apply	CO1	2															
3. List out the characteristics of algorithm	Remember	CO1	2															
4. Define Brute force algorithm.	Remember	CO2	2															
5. Solve the job scheduling problem using Greedy Technique . <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Jobs</td> <td>J1</td> <td>J2</td> <td>J3</td> <td>J4</td> </tr> <tr> <td>Deadline</td> <td>2</td> <td>1</td> <td>2</td> <td>2</td> </tr> <tr> <td>Profit</td> <td>30</td> <td>10</td> <td>35</td> <td>15</td> </tr> </table>	Jobs	J1	J2	J3	J4	Deadline	2	1	2	2	Profit	30	10	35	15	Apply	CO2	2
Jobs	J1	J2	J3	J4														
Deadline	2	1	2	2														
Profit	30	10	35	15														

PART – B (5x8=40)

Answer All Questions

6. Discuss the fundamentals of the Asymptotic Notations with example.	Understand	CO1	8
7. Solve the following recurrence relations (i) $T(n) = T(n-1) + n$ (ii) $T(n) = T(n/2) + 1$	Apply	CO1	16
8. Give the answer for the following problem $C[] = A[] * B[]$ using "Strassen Multiplication Method"	Apply	CO2	16
$A = \begin{bmatrix} 2 & 5 & 3 & 1 \\ 3 & 0 & 1 & 0 \\ 4 & 4 & 2 & 2 \\ 1 & 3 & 7 & 5 \end{bmatrix} \quad B = \begin{bmatrix} 4 & 2 & 0 & 2 \\ 2 & 1 & 3 & 1 \\ 5 & 3 & 8 & 0 \\ 2 & 0 & 2 & 2 \end{bmatrix}$			

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
1	2	10	18				30
2	2		18				20

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SESSIONAL EXAMINATION – I – ODD SEMESTER

[2024-2025]

Course Name/Code	DESCRIPTIVE ANALYTICS /213CSE3305	Date & Session	:	29.08.2024 / AN
Degree/Branch	B.Tech/ Computer Science and Engineering	Duration	:	90 Minutes
Semester/Section	V	Max. Marks	:	50 Marks

Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
8	42	-	-	-	-	50

Course Outcomes for Assessment in this Test:

COs	Course Outcome
CO1	Understand the Concepts of Business Intelligence (BI), BI Tools and BI Systems.
CO2	Evaluate the Business Intelligence (BI) Solutions based on Software Development Kit.

PART – A (5 x 2 = 10 Marks)
Answer All Questions

1. What is Business Intelligence?	Remember	CO1	2
2. Mention the use of OLAP in BI.	Remember	CO1	2
3. Define Dashboard and Gap Analysis in BI.	Remember	CO1	2
4. Define Business Query. What is its importance?	Remember	CO2	2
5. How Mobile Business Intelligence is useful?	Understand	CO2	2

PART – B (5x8=40)
Answer All Questions

Pattern	Mapping COs	Marks
Understand	CO1	8
Understand	CO1	8
Understand	CO1	8
Understand	CO2	8
Understand	CO2	8

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	6	24	-	-	-	-	30
CO2	2	18	-	-	-	-	20

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END SEMESTER EXAMINATIONS - NOV/DEC 2024

Course Code	: 213CSE3305	Duration	: 180 Minutes
Course Name	: Descriptive Analytics	Max. Marks	: 100
Degree	: B.Tech.		

PART – A (20 Marks) Answer All Questions		Pattern	Mapping COs	Marks
1	What is Business Intelligence (BI), and why is it important for organizations?	Understand	CO1	2.0
2	Explain the concept of SaaS in the context of Business Intelligence	Remember	CO1	2.0
3	What is the purpose of Business Query and Reporting in Business Intelligence?	Understand	CO2	2.0
4	Explain the difference between dashboards and scorecards in Business Intelligence	Understand	CO2	2.0
5	What are the primary stages of a typical Business Intelligence (BI) project?	Remember	CO3	2.0
6	Explain the significance of project tasks in Business Intelligence project management	Understand	CO3	2.0
7	What is the primary objective of building reports in a BI system?	Understand	CO4	2.0
8	How does drill-up functionality enhance the usability of BI reports?	Remember	CO4	2.0
9	What are the key differences between centralized and decentralized BI architectures?	Remember	CO5	2.0
10	Define the concept of a phased and incremental BI roadmap.	Analyze	CO5	2.0

PART – B (80 Marks) Answer All Questions		Pattern	Mapping COs	Marks
11.A	Describe the components and architecture of a typical BI system in detail. How do these components work together to provide meaningful insights to users?	Understand	CO1	16.0
OR				
11.B	Discuss the scope of BI solutions in the context of modern organizations. Explain how BI can help organizations gain a competitive advantage	Understand	CO1	16.0
12.A	Compare and contrast reporting, dashboards, and scorecards in BI. How do these components cater to different user needs within an organization?	Understand	CO2	16.0
OR				
12.B	Discuss the importance of Business Query and Reporting in BI. Explain the key steps involved in creating effective reports for data analysis and decision-making	Understand	CO2	16.0

PART – B (80 Marks)
Answer All Questions

		Pattern	Mapping COs	Marks
13.A	Explain the project tasks involved in BI project management. How do these tasks ensure the successful completion of BI projects, and what challenges may arise during task execution?	Understand	CO3	16.0
OR				
13.B	Describe the stages of a typical Business Intelligence project in detail, from project initiation to deployment. Highlight the key activities and deliverables in each stage	Understand	CO3	16.0
14.A	Discuss various Data visualization techniques commonly used in building reports for Business Intelligence.	Remember	CO4	16.0
OR				
14.B	Describe the process of building a report in a Business Intelligence system, from data selection to the final visualization. Highlight best practices for designing informative and user-friendly reports	Remember	CO4	16.0
15.A	Explain the concept of Databackup and restoration in Business Intelligence. Discuss the necessity of Databackup in any organization.	Understand	CO5	16.0
OR				
15.B	Explain the importance of Authentication, authorization, and access permission in Business Intelligence Security/	Understand	CO5	16.0

Assessment Pattern as per Bloom's Taxonomy:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2.0	34.0	0	0	0	0	36
CO2	0	36.0	0	0	0	0	36
CO3	2.0	34.0	0	0	0	0	36
CO4	34.0	2.0	0	0	0	0	36
CO5	2.0	32.0	0	2.0	0	0	36
Total	40	138	0	2	0	0	180
