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**Kalasalingam Academy of Research and Education**

(Deemed to be University)

Anand Nagar, Krishnankoil – 626 126.

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

Course Name/Code	<b>Software Engineering/ 212CSE2303</b>	Date & Session	:	23.08.2023 & FN
Degree/Branch	<b>B.Tech. / CSE</b>	Duration	:	90 Minutes
Semester/Section	<b>V / CBCS</b>	Max. Marks	:	50 Marks

**Assessment Pattern as per Bloom's Taxonomy:**

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
8	26	16	0	0	0	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.

<b>PART – A (5 x 2 = 10 Marks)</b> <b>Answer All Questions</b>		Pattern	Mapping COs	Marks
1. Define Software Engineering.	Remember	CO1	(2)	
2. List the five activities in the generic process framework.	Remember	CO1	(2)	
3. What are the three kinds of actors in a use case?	Remember	CO1	(2)	
4. Define Elaboration phase.	Remember	CO2	(2)	
5. Explain System operations.	Understand	CO2	(2)	

<b>PART – B (40 Marks)</b> <b>Answer All Questions</b>		Pattern	Mapping COs	Marks
6. Explain briefly the three common formats of USE CASE.	Understand	CO1	(8)	
7. Explain Water fall Model. What are the problems that are sometimes encountered when the waterfall model is applied?	Understand	CO1	(16)	
8. Consider a system for administering the lending of books at a university library. A person must be a member of the university's community and must be in good standing – that is, not have any outstanding fines or overdue books – to borrow books. A book may be borrowed for up to two weeks at a time. A book loan may be renewed if the book is returned before the loan's due date and if no other library member has expressed an interest in borrowing the book. If a book is returned after the loan's due date, the borrower will be charged a fine of Rs.5 for each late day. Fines are paid to the library staff at the circulation desk, where books are returned. Heavily-used books may be put on reserve, meaning that members can read them only in the library and cannot borrow them. Build a sequence diagram for the above stated scenario with the detailed description.	Apply	CO2	(16)	

**Assessment Summary:**

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	6	24	0	0	0	0	30
CO2	2	2	16	0	0	0	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 – I – ODD SEMESTER [2023-2024]**

Course Name/Code	Design and Analysis of Algorithms /212CSE3301	Date & Session	: 24-08-2023 11.15-12.45A.M
Degree/Branch	B. Tech CSE (All streams) / IT	Duration	: 90 Minutes
Semester/Section	V <sup>th</sup> Semester / III <sup>rd</sup> Year	Max. Marks	: 50 Marks

**Assessment Pattern as per Bloom's Taxonomy:**

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
4	8	28	10	--	--	50

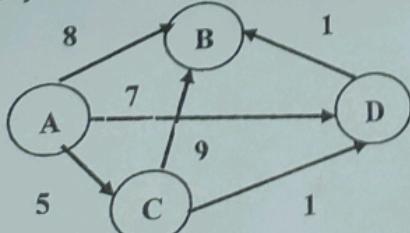
**Course Outcomes for Assessment in this Test:**

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**

		Pattern	Mapping COs	Marks
1.	Write the characteristics of algorithm	Remember	CO1	02
2.	Apply masters theorem and time the complexity for the following $T(n) = 7T(n/2) + n^2$ [GATE]	Apply	CO1	02
3.	Find the time and space complexity for the following code for (i=0;i<n; i++) {     for ( j =0; j <n; j/2) {     print(j) } print(i) }	Analyze	CO1	02
4.	Write the algorithm of string matching using brute force approach	Remember	CO2	02
5.	Find the single source shortest path for the following graph using greedy technique (starting vertex : A)	Apply	CO2	02



PART - B Answer All Questions		Pattern	Mapping COs	Marks
6.	a) Explain briefly about the Asymptotic notations with suitable examples. b) Analyze the time complexity of tower of Hanoi using backward substitution method	Understand	CO1	8
7.	Construct the Huffman's tree for the following data and obtain its Huffman's Code using greedy technique	Analyze	CO1	8
8.	A      B      C      D 60      5      30      5 Describe the algorithm for solving LCS using dynamic programming and apply the same for the stream sequence $X = CBCCBC$ $Y = BCBBCB$	Apply	CO2	16

Assessment Summary:

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	2	8	2	10			22
CO2	2		26				28

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**SESSIONAL EXAMINATION – II – ODD SEMESTER [2022-2023]**

Course Name/Code	Design and Analysis of Algorithm /212CSE3301	Date & Session	: 12.10.2023 11.15-12.45A.M
Degree/Branch	B.Tech CSE (all streams) / IT	Duration	: 90 Minutes
Semester/Section	V <sup>th</sup> Semester/ III <sup>rd</sup> Year	Max. Marks	: 50 Marks

**Assessment Pattern as per Bloom's Taxonomy:**

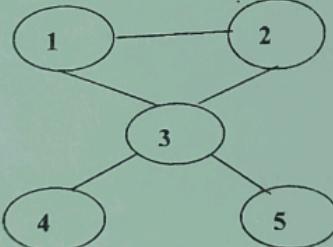
Remember	Understand	Apply	Analyze	Evaluate	Create	Total
	20	26	4			50

**Course Outcomes for Assessment in this Test:**

COs	Course Outcome
CO3	Analyze the differences in design techniques and apply Greedy and Dynamic Programming strategies to solve Optimization problems
CO4	Understand Tractable and Intractable problems and apply reduction techniques to find problem classes

**PART – A (5 x 2 = 10 Marks)**

**Answer All Questions**

1.	Draw the 8 queens problem solution using backtracking	Pattern	Mapping COs	Marks
2.	The Following graph does not have a hamiltonian cycle. State the reason	Analyze	CO3	2
				
3.	Compare backtracking and branch and bound techniques	Analyze	CO4	2
4.	Distinguish between deterministic and non-deterministic algorithm	Understand	CO4	2
5.	Define Halting problem	Understand	CO4	2

**PART – B**

**Answer All Questions**

6.	Solve the assignment problem using branch and bound technique	Pattern	Mapping COs	Marks																
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td><td>J1</td><td>J2</td><td>J3</td></tr> <tr> <td>A</td><td>17</td><td>2</td><td>14</td></tr> <tr> <td>B</td><td>4</td><td>6</td><td>13</td></tr> <tr> <td>C</td><td>12</td><td>11</td><td>5</td></tr> </table>		J1	J2	J3	A	17	2	14	B	4	6	13	C	12	11	5	Apply	CO3	8
	J1	J2	J3																	
A	17	2	14																	
B	4	6	13																	
C	12	11	5																	

7. With a neat state space tree explain the knapsack problem using branch and bound technique and solve the same using the following values and analyze its time complexity ( $W=12$ )

Items	Weight	Values
1	5	50
2	8	48
3	5	25
4	3	12

Apply

CO3

16

8. a) Prove that SAT is NPC with suitable example  
b) Explain the types of reduction techniques in detail

Understand  
Understand

CO4  
CO4

8

8

**Assessment Summary:**

COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO3			26	2			28
CO4		20		2			22

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

Course Name/Code	<b>OPERATING SYSTEMS/212CSE3303</b>	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**

- State the convey effect in operating system
- Differentiate kernel mode with user mode
- Recall the term “throughput”
- What is a process?
- Why is the Operating System viewed as a resource allocator & control program?

**Pattern**      **Mapping COs**      **Marks**

Remember	CO1	(2)
Analyze	CO1	(2)
Understand	CO2	(2)
Understand	CO2	(2)
Analyze	CO1	(2)

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

- Explain the various types of operating system.

**Pattern**      **Mapping COs**      **Marks**

Understand	CO1	8
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- Consider the set of 5 processes whose arrival time and burst time are given below-

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- pre-emptive, calculate the average waiting time and average turn around time.

- 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

- Discuss the process states with a neat sketch.

**Remember**      **CO2**      **8**

- Illustrate the Operating system structures.

**Understand**      **CO1**      **8**

**Assessment Summary:**

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

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**SESSIONAL EXAMINATION – II- ODD SEMESTER**

[2023-2024]

Course Name/Code	212CSE3303 - OPERATING SYSTEMS	Date & Session	:	11.10.2023 & 3.00 PM – 4.30PM (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
2	12	32	4			50

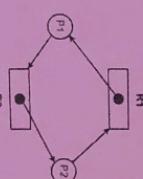
**Course Outcomes for Assessment in this Test:**

- CO3      Understand process synchronization and deadlock mechanism.
- CO4      Evaluate different memory management schemes and page replacement algorithms.

**PART – A (5 x 2 = 10 Marks)**

**Answer All Questions**

1. Write the Need of process synchronization.
2. Differentiate Binary semaphore and Counting semaphore
3. Recall the term “cache memory”.
4. What is the term called segmentation?
5. Consider the following Resource allocation graph and find if the system is in a deadlock state or not.



**PART – B (5x8=40)**

**Answer All Questions**

6. Explain the Reader's and Writer's problem with its solutions.
7. A system uses 3-page frames for storing process pages in main memory. It uses the Least Recently Used (LRU) page replacement policy. 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, 5, 0, 6, 7, 2. Also calculate the Hit ratio, Miss ratio and explain it?

Course Name/Code	SESSIONAL EXAMINATION – I- ODD SEMESTER [2023]	OPERATING SYSTEMS/212CSE3303	Date & Session
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8. Considering a system with five processes P0 through P4 and three "critical sections", using Banker's algorithm, the following table shows the current state of the system.

Since resources of type A, B, C, D. By using banker's algorithm

- Find the need matrix?
- Is the system in a safe state? If yes, then what is the safe sequence?

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

Course Name/Code	Deep Learning /213CSE301	Date & Session	24.08.2023 & AN
Semester/Section	B.E/Computer Science and Engineering V	Duration	90 Minutes

Max. Marks : 50 Marks

### Assessment Pattern as per Bloom's Taxonomy:

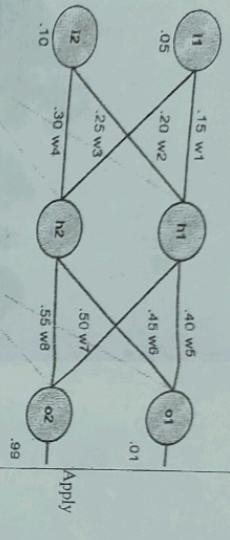
Remember	Understand	Apply	Analyze	Evaluate	Create	Total
10	8	32				50

### Course Outcomes for Assessment in this Test:

COs	Course Outcome		
CO1	Understand and apply Single layer and Multi layer perceptron networks to solve complex learning problems efficiently.		
CO2	Apply Regularization and Optimization criterions to improve performance of learning models.		

PART – A (5 x 2 = 10 Marks) Answer All Questions		Patten	Mapping COs	Marks
1.	Differentiate : Single layer and Multilayer Perceptron .	Understand	CO1	2
2.	A 4-input neuron has weights 2, 5, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. Find the output of this.	Understand	CO1	2
3.	What is Boltzman Learning?	Understand	CO1	2
4.	Let's the training dataset having 1000 training samples. And we want to break the dataset into a batch size of 50. Suppose we are going for 10 epochs, then the total number of iterations will be ?	Understand	CO2	2
5.	Differentiate training set, test set and validation set	Remember	CO2	2
PART – B (40 Marks) Answer All Questions		Pattern	Mapping COs	Marks
6.	Explain the following concepts	Remember	CO1	8
1)	RBF			
2)	K-fold Cross Validation			

7. Perform the backward pass on the following neural network and find the new weights of w5, w6, w7 and w8



8. Explain the following activation function in detail
- Binary Step
  - Sigmoid
  - ReLU
  - Softmax
- Consider a 5-input neuron has inputs as 2, 0, -1, 1 and -3 and respective weights are 2, 1, 1, 1, 1. Apply the above activation function and find the output.

	Apply	CO1	16

#### Assessment Summary:

Cos	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
CO1	8	6	16				30
CO2	2	2	16				20

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Process 1	4. What is the term called segmentation?
P1	
P2	
P3	5. Consider the following statements:

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## SESSIONAL EXAMINATION – I– ODD SEMESTER 2023-2024

Course Name/Code	Computational Linguistics And Natural Language Processing /213CSE2306	Date & Session	: 25/08/2023 & FN
Degree/Branch	B.Tech(CSE)	Duration	: 90 Minutes
Semester/Section	III Year/AIML	Max Marks	: 50 Marks

### Assessment Pattern as per Bloom's Taxonomy:

Remember	Understand	Apply	Analyze	Evaluate	Create	Total
2	30	18	-	-	-	50

### Course Outcomes for Assessment in this Test:

Cos Course Outcome

CO1 Understanding the principles of Natural Language Processing

CO2 Study of Semantic analysis in Natural Language Processing

### PART – A (5 x 2 = 10 Marks)

Answer All Questions

- Mention the Goals of Computational Linguistics.
- Difference between Rule based NLP and Statistical NLP
- Define POS Tagging and identify the meaning for the following tagging. i) DT ii) NNS iii) TO iv) IN
- Describe the purpose of Creating corpus for any Language?
- Construct a document vector table for the given corpus.
- Document 1: We are going to Mumbai
- Document 2: Mumbai is a famous place.
- Document 3: We are going to a famous place.
- Document 4: I am famous in Mumbai.

### PART – B

Answer All Questions

- Explain the working principle of Natural language Generation with neat sketch.
- Develop a Constituency parse tree and Dependency parse tree for the given sentence:

"Markus drove the blue car to London"

Use the following grammar rules to create the parse tree:  
S → NP VP  
NP → Det , Noun, Pronoun, Proper Name  
VP → V(NP)(PP)(Adverb)

- PP → Pronoun(NP), AP → Adjective(PP).
- Discuss the stages in annotation development cycle.

- Calculate the probabilities that every part of speech for the sentence "Dev pat Mary Jane" using Hidden markov model(HMM) states.

- Dev saw will.
- Mary saw Jane.
- Mary Jane spot dev.
- Will spot dev.
- Jane pat Dev.

- Given below are the following sentences:  
S1: Dev saw will.  
S2: Mary saw Jane.  
S3: Mary Jane spot dev.  
S4: Will spot dev.  
S5: Jane pat Dev.  
S6: Jane saw Mary.

### Assessment Summary:

Assessment	Remember	Understand	Apply	Analyze	Evaluate	Create	Total
Cos	02	20	08	-	-	-	30
CO1	-	10	10	-	-	-	20
CO2	-	-	-	-	-	-	-

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Process  
P1  
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