



Time:

S.NO

Answer All Questions

Max Marks: 50

Choice

Options

Marks

CO

CO
BTL

COI
BTL

1. List the applications of artificial neural networks with examples.

choice
Q-2

4.5Marks

CO1

3

1

2. Define agent, and environment and discuss how agents interact with environments.

choice
Q-3

4.5Marks

CO1

3

1

3. Illustrate different types of environments with suitable examples.

choice
Q-4

8Marks

CO1

3

2

4. Discuss greedy best-first search algorithm in detail.

choice
Q-5

8Marks

CO1

3

2

Answer all the questions.

choice
Q-6

12.5Marks

CO1

3

3

5.A. Discuss the working of the bidirectional search technique.

choice
Q-7

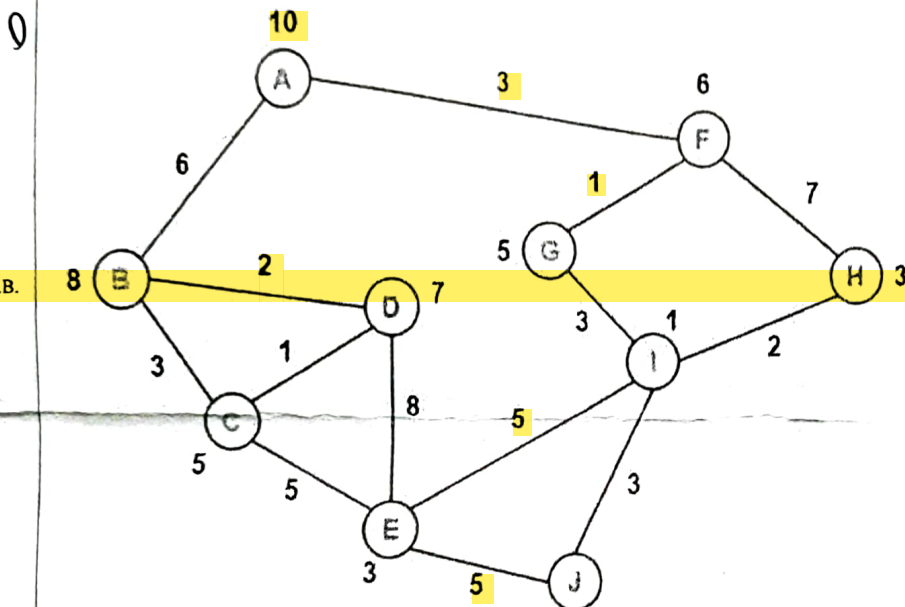
4.5Marks

CO1

3

3

Observe the following graph. The numbers written on the edges represent the distance between the nodes. The numbers written on nodes represent the heuristic value. Identify the most cost-effective path to reach from start state A to final state J using the A* Algorithm.



6. Answer all the questions.

choice
Q-8

12.5Marks

CO1

3

3

6.A. Define in your own words the following terms: state, state space, search tree, search node, goal, action, transition model, and branching factor.

choice
Q-9

4.5Marks

CO1

3

3

6.B. Demonstrate the working of breadth-first search, depth-first search, and iterative deepening depth-first search techniques using a suitable example.

choice
Q-10

8Marks

CO1

3

3

7. Explain the constraint satisfaction problem with an example.

choice
Q-11

4.5Marks

CO2

3

1

8. Explain about online search agents.

choice
Q-12

4.5Marks

CO2

3

1

9. Explain briefly how the local search, hill climbing, and Simulated Annealing work.

choice
Q-13

8Marks

CO2

3

2

10. Explain the working of a genetic algorithm with a suitable example.

choice
Q-14

8Marks

CO2

3

2

11. Answer all the questions.

choice
Q-15

12.5Marks

CO2

3

3

11.A. Draw a game tree (partial) for the Tic-Tac-Toe game.

choice
Q-16

4.5Marks

CO2

3

3

11.B. Demonstrate the working of alpha-beta pruning with a suitable example.

choice
Q-17

8Marks

CO2

3

3

12. Answer all the questions.

choice
Q-18

4.5Marks

CO2

3

3

12.A. Write pseudo code for the min-max algorithm.

choice
Q-19

4.5Marks

CO2

3

3

12.B. Solve the following crypt arithmetic puzzle. Write constraint equations and find one solution using DFS by showing the steps involved in finding the solution. SEND + MORE = MONEY.

choice
Q-20

8Marks

CO2

3

3

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B.Tech - Odd Sem : Semester In Exam-I

Academic Year:2022-2023

21CS2111RA - SOFTWARE ENGINEERING

Set No: 2

Time:		Max.Marks: 50					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	Define Reverse Engineering and sketch the process of reverse engineering with a help of a neat diagram	choice Q-2		4.5Marks	CO1	2	2
2.	Define Software & Software Engineering			4.5Marks	CO1	2	2
3.	Examine the prescriptive approach for the structure and order in software development	choice Q-4		8Marks	CO1	2	2
4.	Outline the essence of software engineering practices			8Marks	CO1	2	2
5.	a. Classify the phases of the unified process model and explain in detail. 6Marks b. Explain how umbrella activities are helpful while developing the software. 6.5Marks	choice Q-6		12.5Marks	CO1	2	2
6.	a. Explain the importance of any two specialized process models. 6Marks b. Illustrate how incremental model is employed in spiral model. 6.5Marks			12.5Marks	CO1	2	2
7.	Sketch the Lifecycle activities of Extreme Programming with a neat diagram	choice Q-8		4.5Marks	CO2	3	3
8.	Illustrate the process of incorporating quality in generating requirements, for any social networking website?			4.5Marks	CO2	3	3
9.	Generate a sequence diagram for return of a book in Library Management System.	choice Q-10		8Marks	CO2	3	3
10.	Validation activities take place at the beginning of every software process iteration. Outline all of them			8Marks	CO2	3	3
11.	a. Mark Out the types of requirements identified by Quality Function Deployment. 6Marks b. Identify and draw the Role of the use case diagram for Online Banking case study while describing the steps involved in it. 6.5Marks	choice Q-12		12.5Marks	CO2	3	3
12.	a. Narrate how is Refactoring useful in the agile development process. 6Marks b. Set out a Plan for establishing the ground work in requirement engineering 6.5Marks			12.5Marks	CO2	3	3

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B.Tech - Odd Sem : Semester in Exam-II
Academic Year: 2022-2023
21CS2213AA - AI FOR DATA SCIENCE
Set No: 2

x, y : Brothers $(x, y) \rightarrow$
Siblings (x, y)

Time:		Max.Marks: 50					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	What are the properties of a good system for the representation of the knowledge?	choice Q-2		4.5Marks	CO3	3	1
2.	Convert the following English language sentences into Predicate logic: i) Brothers are siblings ii) Siblinghood is symmetric iii) Everybody loves somebody iv) Every dog has tail			4.5Marks	CO3	3	1
3.	Outline unification algorithm in predicate logic.	choice Q-4		8Marks	CO3	3	2
4.	Write various knowledge representation issues. Provide the solution of any two issues.			8Marks	CO3	3	2
5.	Answer all the questions.	choice Q-6		12.5Marks	CO3	3	3
5.A.	Write an algorithm to define a simple knowledge-based agent.			4.5Marks	CO3	3	3
5.B.	Illustrate backward chaining procedure for drawing inference in predicate logic with the help of an example.			8Marks	CO3	3	3
6.	Answer all the questions.			12.5Marks	CO3	3	3
6.A.	Define meta rules? Explain the use of meta rules with suitable example.			4.5Marks	CO3	3	3
6.B.	State and illustrate the Resolution algorithm in predicate logic. Demonstrate how resolution is useful for Question answering.			8Marks	CO3	3	3
7.	What do you understand by true positive rate and false-positive rate?	choice Q-8		4.5Marks	CO4	4	1
8.	What is dimensionality reduction and write its benefits.			4.5Marks	CO4	4	1
9.	Explain about multiple plots in one window.	choice Q-10		8Marks	CO4	4	2
10.	What is Selection Bias and what are the various types?			8Marks	CO4	4	2
11.	Answer all the questions.	choice Q-12		12.5Marks	CO4	4	4
11.A.	Why is data cleaning crucial? Justify the statement.			4.5Marks	CO4	4	3
11.B.	Illustrate in detail about data pre-processing with neat sketch			8Marks	CO4	4	4
12.	Answer all the questions.			12.5Marks	CO4	4	4
12.A.	What libraries do data scientists use to plot data in Python?			4.5Marks	CO4	4	3
12.B.	What happens if the files become corrupted as you are cleaning it? Are you prepared to start over?			8Marks	CO4	4	4

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B.Tech - Odd Sem : Semester in Exam-II

Academic Year: 2022-2023

21CS2111RA - SOFTWARE ENGINEERING

Set No: 1

Time:		Max.Marks: 50					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	List and detail various steps involved in Scrum software development methodology.	choice Q-2		4.5Marks	CO3	4	4
2.	The terms "epic", "story" and "Value Stream" has specific meaning in the context of SAFe explain them in detail with the help of a diagram?			4.5Marks	CO3	4	4
3.	Explain how Kanban Principles help in designing a better Agile Method	choice Q-4		8Marks	CO3	4	4
4.	Explain how scaled agile framework is different from other agile models			8Marks	CO3	4	4
5.	a. Explain the nine principles of SAFe based on Lean and Agile methods? 6.5Marks b. Develop a sequence diagram for withdraw the money from bank ATM. 6Marks	choice Q-6		12.5Marks	CO3	4	4
6.	a. Analyse common mistakes and misunderstandings in Scrum? 6.5Marks b. Develop an activity diagram for issuing a book in the library.			12.5Marks	CO3	4	4
7.	Differentiate between Test Driven Development and Traditional Testing	choice Q-8		4.5Marks	CO4	4	4
8.	Draw a diagram to explain how software testing with a big picture is carried out in "Spiral" software development methodology			4.5Marks	CO4	4	4
9.	Summarize various strategic approaches that are used in software Testing	choice Q-10		8Marks	CO4	4	4
10.	Explain the 5 core steps of Six Sigma Methodology			8Marks	CO4	4	4
11.	a. Unit Testing and Intergration testing are the two testing strategies for conventional software explain them in detail. 6.5Marks b. List out the Specific goals and generic goals of Capability Maturity Model Integration	choice Q-12		12.5Marks	CO4	4	4
12.	a. Outline the concepts of Smoke and Regression testing. 6 Marks b. For a context of developing a simple arithmetic operations write java code and explain how Test Driven Development works. 6.5Marks			12.5Marks	CO4	4	4

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B.Tech - Odd Sem : End Semester Exam
Academic Year: 2022-2023

21MT2103RA - PROBABILITY, STATISTICS & QUEUEING THEORY

Set No. 3

Time:

Max.Marks: 100

S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL																						
1.	Discuss in detail about Bernoulli distribution	choice Q-2		10Marks	CO1	3	2																						
2.	The average number of accidents on any day on a national highway is 1.8. Determine the probability that the number of accidents is i) at least one ii) at most one iii) exactly one.			10Marks	CO1	3	2																						
3.	Three factories produce light bulbs to supply the market. Factory A produces 20% of the total supply of bulbs, Factory B produces 50% and Factory C produces 30%. 2% of the bulbs produced in factory A, 1% of the bulbs produced in factory B and 3% of the bulbs produced in factory C are defective. A bulb is selected at random in the market and found to be defective. What is the probability that this bulb was produced by factory B	choice Q-4		15Marks	CO1	3	2																						
4.	I toss a coin twice. Let X be the number of observed heads. Find the Cumulative Distribution Function of X.			15Marks	CO1	3	2																						
5.	Determine the mean and variance of the random variable X having the following probability distribution. <table><tr><td>X = x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>P(x)</td><td>0.15</td><td>0.10</td><td>0.10</td><td>0.01</td><td>0.08</td><td>0.01</td><td>0.05</td><td>0.02</td><td>0.28</td><td>0.20</td></tr></table>	X = x	1	2	3	4	5	6	7	8	9	10	P(x)	0.15	0.10	0.10	0.01	0.08	0.01	0.05	0.02	0.28	0.20	choice Q-6		10Marks	CO2	3	1
X = x	1	2	3	4	5	6	7	8	9	10																			
P(x)	0.15	0.10	0.10	0.01	0.08	0.01	0.05	0.02	0.28	0.20																			
6.	Write the uniform, exponential and normal probability distribution function with their mean and variance			10Marks	CO2	3	1																						
7.	Explain the joint distribution with a suitable example.	choice Q-8		15Marks	CO2	3	2																						
8.	Consider two random variables X and Y with joint PMF given in Table Answer the following: (a) Find P (X=0, Y≤1). (b) Find the marginal PMFs of X and Y. (c) Find P(Y=1 X=0). <p style="text-align: center;">Table: Joint PMF of X and Y</p> <table><tr><td></td><td>Y=0</td><td>Y=1</td><td>Y=2</td></tr><tr><td>X=0</td><td>1/6</td><td>1/4</td><td>1/8</td></tr><tr><td>X=1</td><td>1/8</td><td>1/6</td><td>1/6</td></tr></table>		Y=0	Y=1	Y=2	X=0	1/6	1/4	1/8	X=1	1/8	1/6	1/6			15Marks	CO2	3	2										
	Y=0	Y=1	Y=2																										
X=0	1/6	1/4	1/8																										
X=1	1/8	1/6	1/6																										
9.	Explain the procedure to test significance and goodness fit.	choice Q-10		10Marks	CO3	3	1																						
10.	The following data pertain to the marks in subjects A and B in a certain examination: Mean marks in A=39.5; Mean marks in B=47.5; Standard deviation of marks in A=10.8; Standard deviation of marks in B=16.8. Coefficient of correlation between marks in A and marks in B=0.42. Compute the two lines of regression and explain why there are two regression equations. Give the estimate of marks in B for candidates who secured 50 marks in A			10Marks	CO3	3	1																						
11.	Two sample t-test is used to determine if two means are equal. A common application is to test if a new process or treatment is superior to the current process or treatment. The data may be either paired or unpaired. Paired means that there is a one-one correspondence between the values in the two samples., groups can be paired or unpaired. • Now, compare two unpaired groups of birds to see if they spend the same amount of time aging. Find the following: • What is the null hypothesis? • What is the alternate hypothesis? • What is the p-value? • Do the birds spend the same amount of time aging?	choice Q-12		15Marks	CO3	3	2																						

Blue Jay	Cardinal
30	10
44	15
33	10
14	12
12	18
13	9
17	14
21	16
14	18
50	10

12.	Blood glucose levels for obese patients have a mean of 100 with a standard deviation of 15. A researcher thinks that a diet high in raw cornstarch will have a positive or negative effect on blood glucose levels. A sample of 30 patients who have tried the raw cornstarch diet had a mean glucose level of 140. Test the hypothesis that the raw cornstarch had an effect.	14	15Marks	CO3	3	2
13.	Explain the queuing System using a suitable example. And list out any five performance measures of a queuing system with their respective formulas	choice Q-14	10Marks	CO4	3	1
14.	Explain symbolic representation a/b/c: d/e are the queuing model		10Marks	CO4	3	1
15.	Make use of the following description of a queueing process to find the fraction of potential customers entering the system. A service center consists of 1 server, working at an exponential rate of 4 services per hour. Customers arrive at a Poisson rate of 3 per hour, assuming the system capacity is at most 3 customers.	choice Q-16	15Marks	CO4	3	2
16.	A T.V repair man repairs the sets in the order in which they arrive and expects that the time required to repair a set has an ED with mean 30mins. The sets arrive in a Poisson fashion at an average rate of 10/8 hrs. a day. (a) What is the expected idle time/day for the repairman? b) How many TV sets will be there awaiting repair?		15Marks	CO4	3	2

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B.Tech - Odd Sem : End Semester Exam
Academic Year: 2022-2023

21CS2111RA - SOFTWARE ENGINEERING

Set No: 1

81
11/4/21

Time:

Max.Marks: 100

S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1	In what way Software Engineering is useful and elaborate in detail about Software Process.	choice Q-2	✓	10Marks	CO1	2	2
2	State Reverse Engineering and sketch the process of reverse engineering with a help of a neat diagram			10Marks	CO1	2	2
3	a. Outline the challenges of Large Projects that occur in the software development process 8M b. Interpret the importance of any two specialized process models. 7M	choice Q-4	✓	15Marks	CO1	2	2
4	a. Illuminate how process framework activities are helpful while developing the software. 8M b. Enlighten about waterfall process model in detail with a neat diagram. 7M			15Marks	CO1	2	2
5	Sketch the Lifecycle activities of Extreme Programming with a neat diagram and detail each step	choice Q-6	✓	10Marks	CO2	3	3
6	Outline and detail the Validation activities that take place at the beginning of every software process iteration			10Marks	CO2	3	3
7	a. List out and detail the steps for identifying the stakeholders 8M b. Design a class diagram for library management system and detail its procedure. 7M	choice Q-8	✓	15Marks	CO2	3	3
8	a. List and discuss various steps involved in negotiation requirements. 8M b. Summarize various types of Agile Methods that are used across the industries. 7M			15Marks	CO2	3	3
9	Explain how Kanban Principles help in designing a better Agile Method.	choice Q-10	✓	10Marks	CO3	4	4
10	Mention some of the key differences between scrum and Kanban?			10Marks	CO3	4	4
11	a. List and detail various steps involved in Scrum software development methodology. 8M b. Develop a sequence diagram for withdrawing the money from bank ATM and write in detail its procedure. 7M	choice Q-12	✓	15Marks	CO3	4	4
12	a. Explain the nine principles of SAFe based on Lean and Agile methods? 7 Marks b. Develop an activity diagram for issuing a book in the library and write in detail its procedure. 8 Marks			15Marks	CO3	4	4
13	Examine Agile Model Driven Development (AMDD) and list out and explain the Advantages of Test Driven Development	choice Q-14	✓	10Marks	CO4	4	4
14	White Box testing is called structural testing, Justify the statement. List and detail the steps involved in it			10Marks	CO4	4	4
15	a. Examine the various categories of Black-Box Testing with an example and discuss which among them is more crucial for the success of software development 8M b. Differentiate between Test Driven Development and Traditional Testing. 7M	choice Q-16	✓	15Marks	CO4	4	4
16	a. Unit Testing and Integration testing are the two testing strategies for conventional software explain them in detail. 8M b. List out and detail the Specific goals and generic goals of Capability Maturity Model Integration. 7M			15Marks	CO4	4	4

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B.Tech - Odd Sem : End Semester Exam
Academic Year: 2022-2023

21CS2213AA - AI FOR DATA SCIENCE

Set No: 7

1, 4, 6, 8, 9, 1
14, 15

Time:

Max.Marks: 100

S.NO

Answer All Questions

Choice Options Marks CO BTL

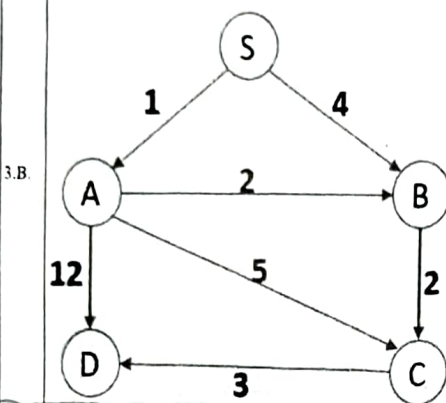
1. Discuss how an Intelligent Agent interacts with Environment, using a suitable diagram. Also give the PEAS description of the task environment for an automated taxi. choice Q-2 10Marks CO1 3

2. Illustrate the logic of Breadth First Search & Depth First Search algorithms with suitable examples 10Marks CO1 3

3. Answer the following choice Q-4 15Marks CO1 3

3.A. Discuss about Online Search Agents and Unknown Environments. 7Marks CO1 3

State and discuss Greedy Best First Search algorithm (GBFS). Consider the following graph and find the most cost-effective path from source state S to destination state D using Greedy BFS Algorithm.



Node	H(node)
S	7
A	6
B	2
C	1
D	0

3.B. 8Marks CO1 3

4. Answer the following 15Marks CO1 3

4.A. Discuss the logic of Depth limited search and Iterative Deepening Search algorithm with suitable examples. 7Marks CO1 3

4.B. Demonstrate the logic of A* search algorithm with suitable example. 8Marks CO1 3

5. State and explain the Local Beam Search algorithm choice Q-6 10Marks CO2 3

6. Outline the syntax and semantics of Genetic Algorithm with the help of an example. 10Marks CO2 3

7. Answer the following choice Q-8 15Marks CO2 3

7.A. Compare "Simple Hill Climbing" algorithm with "Steepest Ascent Hill Climbing" algorithm. 7Marks CO2 3

7.B. Solve the following crypt arithmetic puzzle. Write constraint equations and find one solution using DFS by showing the steps involved in finding the solution. B A S E + B A L L = G A M E S 8Marks CO2 3

8. Answer the following 15Marks CO2 3

8.A. State and discuss the logic of min-max algorithm. 7Marks CO2 3

8.B. How alpha-beta pruning is used to reduce the search space in a game tree? Demonstrate the principle working of alpha-beta pruning with an example. 8Marks CO2 3

9. Define Knowledge-Based agent. Discuss the syntax and semantics of Propositional logic and Predicate logic highlighting the differences between Propositional and Predicate logic. choice Q-10 10Marks CO3 3

10. State and discuss the logic of Resolution Algorithm with the help of an algorithm. 10Marks CO3 3

11. Answer the following choice Q-12 15Marks CO3 3

11.A. Convert the following facts into logical propositions. i) It is raining ii) It is sunny iii) It is windy iv) If it raining, it is not sunny v) Socrates is a man 7Marks CO3 3

11.B. Illustrate forward chaining procedure for drawing inference in predicate logic with the help of an example. 8Marks CO3 3

12. Answer the following 15Marks CO3 3

12.A. List and explain any five rules for converting Wffs into Conjunctive normal form. 7Marks CO3 3

12.B. State and demonstrate the logic of unification algorithm with the help of an example. 8Marks CO3 3

13. What is data science and illustrate data science life cycle with neat sketch. choice Q-14 10Marks CO4 4

14. Why data pre-processing is important. Discuss various steps of data processing. 10Marks CO4 4

15. Answer the following choice Q-16 15Marks CO4 4

15.A. List and explain applications of Data Science 7Marks CO4 4

15.B. Define exploratory data analysis. Discuss various steps in exploratory data analysis 8Marks CO4 4

16. Answer the following 15Marks CO4 4

16.A. Why data cleaning is important. How does data cleaning play a vital role in the analysis? 7Marks CO4 4

16.B. What is scientific visualization? How it is different from other visualization techniques? 8Marks CO4 4