



Shri Vile Parle Kelavani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

(Autonomous College Affiliated to the University of Mumbai)

NAAC Accredited with "A" Grade (CGPA : 3.18)



Department of Computer Engineering

Academic Year 2022-2023

Term Test – I

Course Name: Data Mining and Warehousing

Class: TY (A & B)

Date: 17/10/2022

Maximum Marks: 25

Course Code: DJ19CEC501

Sem: V

Duration: 1 hour

Instructions:

1. Please solve questions in order with clear and dark ink pens
2. Draw figures wherever required

Q. No	Questions	Marks																																								
1a.	<p>Suppose that a hospital tested the age and body fat data for 18 randomly selected adults with the following results:</p> <table><tr><td>Age</td><td>23</td><td>23</td><td>27</td><td>27</td><td>39</td><td>41</td><td>47</td><td>49</td><td>50</td></tr><tr><td>%fat</td><td>9.5</td><td>26.5</td><td>7.8</td><td>17.8</td><td>31.4</td><td>25.9</td><td>27.4</td><td>27.2</td><td>31.2</td></tr><tr><td>Age</td><td>52</td><td>54</td><td>54</td><td>56</td><td>57</td><td>58</td><td>58</td><td>60</td><td>61</td></tr><tr><td>%fat</td><td>34.6</td><td>42.5</td><td>28.8</td><td>33.4</td><td>30.2</td><td>34.1</td><td>32.9</td><td>41.2</td><td>35.7</td></tr></table> <p>Using the data for age and body fat answer the following:</p> <p>(a) Determine the IQR for attribute age</p> <p>(b) Draw the boxplots for age</p> <p>(c) Calculate the Pearson's correlation. Are these two attributes positively or negatively correlated?</p>	Age	23	23	27	27	39	41	47	49	50	%fat	9.5	26.5	7.8	17.8	31.4	25.9	27.4	27.2	31.2	Age	52	54	54	56	57	58	58	60	61	%fat	34.6	42.5	28.8	33.4	30.2	34.1	32.9	41.2	35.7	02 01 02
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1b.	<p>For the following data find dissimilarity</p> <table><tr><td>City</td><td>Test-number</td><td>Results</td><td>Age</td><td>Hours Worked</td></tr><tr><td>Mumbai</td><td>2501</td><td>Excellent</td><td>45</td><td>15</td></tr><tr><td>Thane</td><td>6713</td><td>Fair</td><td>22</td><td>30</td></tr><tr><td>Mumbai</td><td>6723</td><td>Good</td><td>64</td><td>20</td></tr><tr><td>Navi-Mumbai</td><td>2501</td><td>Excellent</td><td>28</td><td>20</td></tr></table> <p>Find the dissimilarity matrix for City, Test-number, Results, Age and Hours Worked individually.</p>	City	Test-number	Results	Age	Hours Worked	Mumbai	2501	Excellent	45	15	Thane	6713	Fair	22	30	Mumbai	6723	Good	64	20	Navi-Mumbai	2501	Excellent	28	20	05															
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2a.	Explain the KDD process with suitable diagram.	05																																																																																																																																						
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2b.	Explain the features of a data warehouse.	05																																																																																																																																						
3.	For the dataset shown below: <table><tr><th>Name</th><th>Give Birth</th><th>Can Fly</th><th>Live in Water</th><th>Have Legs</th><th>Class</th></tr><tr><td>human</td><td>yes</td><td>no</td><td>no</td><td>yes</td><td>mammals</td></tr><tr><td>python</td><td>no</td><td>no</td><td>no</td><td>no</td><td>non-mammals</td></tr><tr><td>salmon</td><td>no</td><td>no</td><td>yes</td><td>no</td><td>non-mammals</td></tr><tr><td>whale</td><td>yes</td><td>no</td><td>yes</td><td>no</td><td>mammals</td></tr><tr><td>frog</td><td>no</td><td>no</td><td>sometimes</td><td>yes</td><td>non-mammals</td></tr><tr><td>komodo</td><td>no</td><td>no</td><td>no</td><td>yes</td><td>non-mammals</td></tr><tr><td>bat</td><td>yes</td><td>yes</td><td>no</td><td>yes</td><td>mammals</td></tr><tr><td>pigeon</td><td>no</td><td>yes</td><td>no</td><td>yes</td><td>non-mammals</td></tr><tr><td>cat</td><td>yes</td><td>no</td><td>no</td><td>yes</td><td>mammals</td></tr><tr><td>leopard shark</td><td>yes</td><td>no</td><td>yes</td><td>no</td><td>non-mammals</td></tr><tr><td>turtle</td><td>no</td><td>no</td><td>sometimes</td><td>yes</td><td>non-mammals</td></tr><tr><td>penguin</td><td>no</td><td>no</td><td>sometimes</td><td>yes</td><td>non-mammals</td></tr><tr><td>porcupine</td><td>yes</td><td>no</td><td>no</td><td>yes</td><td>mammals</td></tr><tr><td>eel</td><td>no</td><td>no</td><td>yes</td><td>no</td><td>non-mammals</td></tr><tr><td>salamander</td><td>no</td><td>no</td><td>sometimes</td><td>yes</td><td>non-mammals</td></tr><tr><td>gila monster</td><td>no</td><td>no</td><td>no</td><td>yes</td><td>non-mammals</td></tr><tr><td>platypus</td><td>no</td><td>no</td><td>no</td><td>yes</td><td>mammals</td></tr><tr><td>owl</td><td>no</td><td>yes</td><td>no</td><td>yes</td><td>non-mammals</td></tr><tr><td>dolphin</td><td>yes</td><td>no</td><td>yes</td><td>no</td><td>mammals</td></tr><tr><td>eagle</td><td>no</td><td>yes</td><td>no</td><td>yes</td><td>non-mammals</td></tr></table> Classify the following using a suitable classification algorithm. <table><tr><td>Give Birth</td><td>Can Fly</td><td>Live in Water</td><td>Have Legs</td></tr><tr><td>yes</td><td>no</td><td>yes</td><td>no</td></tr></table>	Name	Give Birth	Can Fly	Live in Water	Have Legs	Class	human	yes	no	no	yes	mammals	python	no	no	no	no	non-mammals	salmon	no	no	yes	no	non-mammals	whale	yes	no	yes	no	mammals	frog	no	no	sometimes	yes	non-mammals	komodo	no	no	no	yes	non-mammals	bat	yes	yes	no	yes	mammals	pigeon	no	yes	no	yes	non-mammals	cat	yes	no	no	yes	mammals	leopard shark	yes	no	yes	no	non-mammals	turtle	no	no	sometimes	yes	non-mammals	penguin	no	no	sometimes	yes	non-mammals	porcupine	yes	no	no	yes	mammals	eel	no	no	yes	no	non-mammals	salamander	no	no	sometimes	yes	non-mammals	gila monster	no	no	no	yes	non-mammals	platypus	no	no	no	yes	mammals	owl	no	yes	no	yes	non-mammals	dolphin	yes	no	yes	no	mammals	eagle	no	yes	no	yes	non-mammals	Give Birth	Can Fly	Live in Water	Have Legs	yes	no	yes	no	08
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4.	Describe the architecture of data warehouse with suitable diagram.	07																																																																																																																																						



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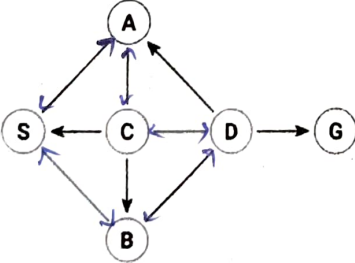
**Department of Computer Engineering
Academic Year 2022-2023
Term Test – I**

Course Name: Artificial Intelligence
Class: TE (A & B)
Date: 18/10/2022
Maximum Marks: 25

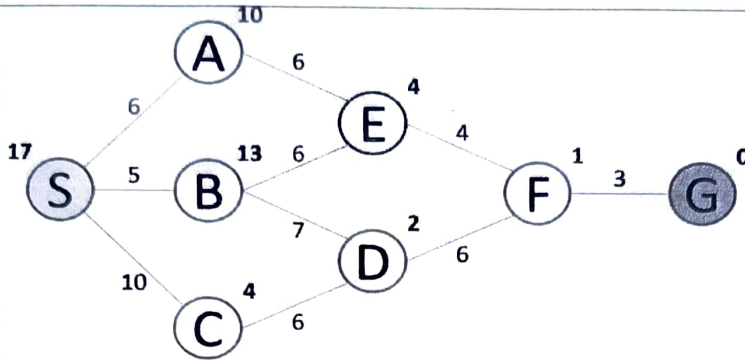
Course Code: DJ19CEC503
Sem: V
Time: 9:00 am – 10:00 am

Instructions:

1. Question **Number 1** is Compulsory.
2. Attempt any **THREE** out of remaining questions.
3. Draw figures wherever required

Q. No	Questions	Marks
1.	List basic types of agents in AI? Explain how did you convert them into learning agents?	04
2	What are the components of well-defined problems? List problems associated with Hill Climbing. Discuss a systematic solution to overcome any ONE problem.	07
3	<p>Consider the given map, S is the start node and G is the goal node. Apply BFS and DFS to find the path from S to G. Display the status of open and close list when both the algorithms find G.</p>  <p>Justify the performance of BFS, DFS w.r.t. Space and Time Complexity.</p>	07
4	Consider the given map, S is the start node and G is the goal node. Demonstrate A* algorithm for given map and write the final path from S to G and the list of closed nodes.	07

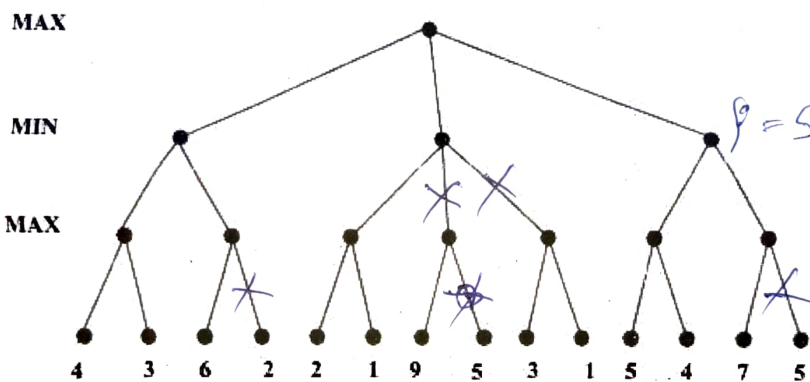
145



5

Discuss the problems associated with Minimax algorithm.
Demonstrate Alpha Beta pruning using given input.

07



ALL THE BEST !!!



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Department of Computer Engineering

Academic Year 2022-2023

Term Test – I

Course Name: Processor Organization and Architecture

Course Code: DJ19CEC502

Class: TE (A & B)

Sem: V

Date: 17/10/2022

Time: 10:30 AM to 11:30 AM

Maximum Marks: 25

Instructions:

1. Please solve questions in order with clear and dark ink pens
2. Draw figures wherever required

Q. No	Questions	Marks
1.a	Implement Booth Multiplication (Signed) for $(-11)*(13)$	8 M
OR		
1.b	Implement Restoring Division for $(13)/(5)$	8 M
2	Illustrate the different Cache Mapping Techniques with suitable diagram and examples.	10 M
3a	Explain the Bus Interface Unit (BIU) of 8086 Microprocessor	7 M
OR		
3b	Explain the Execution Unit (EU) of 8086 Microprocessor	7 M



Department of Computer Engineering
Academic Year 2022-2023
Term Test – I

Course Name: Advanced Database Management System **Course Code:** DJ19CEEC5012
Class: TE - A **Sem:** V
Date: 19/10/2022 **Time:** 09:00 am – 10:00 am
Maximum Marks: 25

Instructions:

1. Please solve questions in order with clear and dark ink pens
2. Draw figures wherever required

Q. No	Questions	Marks
1 a)	How clustering index is different from secondary index? Explain each with diagram.	7
	OR	
1 b)	Define Multilevel indexing. Consider a university database to store students, teachers and courses details. From this database a multilevel index is created on student table using B+ tree. Show Insertion in B+ tree of order 5 for the following keys: 30,31,23,32,22,28,24,29,15,26,27,34,39,36	7
2	How indexed nested loop join works? Explain with suitable example (5marks). Comment on its cost in terms of block access over nested loop join. (2 marks)	7
3	What is Heuristic Query Optimization? Demonstrate steps by step solution for the following query using heuristic optimization. Select e.fname from employee e, project p, works_on w where p.location='Mumbai' and p.pno=w.pno and e.ssn=w.essn and e.salary>50000;	8
4	Write short note on Federated Database.	3

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Department of Computer Engineering
Academic Year 2022-2023
Term Test – I

Program: Honours in Intelligent Computing

Course Name: Nature Inspired Computing

Class: TY (A & B)

Date: 11/11/2022

Maximum Marks: 25

Course Code: DJ19CEHN1C1

Sem: V

Duration: 1 hour

Instructions:

1. Please solve questions in order with clear and dark ink pens
2. Draw figures wherever required

Q. No	Questions	Marks
1.	Draw the flowchart of Explain Error back propagation training algorithm.	05
2a.	Construct a KSOFM net with two cluster units and five input units. The weight vectors for the cluster units are given by $w_1 = [1.0 \ 0.9 \ 0.7 \ 0.5 \ 0.3]$ $w_2 = [0.3 \ 0.5 \ 0.7 \ 0.9 \ 1.0]$ For the input pattern $X_1 = [0.0 \ 0.5 \ 1.0 \ 0.5 \ 0.0]$ and $X_2 = [1.0 \ 0.0 \ 1.0 \ 0.5 \ 0.5]$ Find the new weights using learning rate of 0.25	07
	OR	
2b.	Determine the weights for Hebbian learning of a single neuron network starting with initial weights $w = [1, -1]$, inputs as $X_1 = [1, -2]$, $X_2 = [2, 3]$, $X_3 = [1, -1]$ and $c=1$. Use Binary bipolar activation function.	07
3a.	Explain various types of crossover techniques.	05
	OR	
3b.	Explain the Roulette wheel technique and tournament technique for traditional GA selection with example.	05
4.	Maximize the function $f(x)=x^2$, when $x \in [0,31]$. Show the computation of minimum two generations. Assume the initial population as {12,22,6,17}. (No mutations)	08