



VIT
Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)
CHENNAI

Reg. Number: 21BPS1532

Continuous Assessment Test (CAT) –II- APRIL 2024

Programme	B.Tech (ECE/ECM/CPS/AI&ML/AIR)	Semester	WS 2023-24
Course Code & Course Title	BECE352E -IoT Domain Analyst	Class Number	CH2023240502557, CH2023240502560, CH2023240502562, CH2023240502564 , CH2023240502566, CH2023240502568, CH2023240502570, CH2023240502572, CH2023240502574, CH2023240502576, CH2023240502578, CH2023240502581, CH2023240502583, CH2023240502585, CH2023240502587
Faculty	Dr. Raju Patel, Dr. Berlin Heney V, Dr. B. Nagajayanthi, Dr. Chandramouleshwar Roy, Dr. S. R. Mahapatro, Dr. Srithama Roy, Dr. Rohith G, Dr. Manimaran P, Dr. Mangal Das, Dr. Manigandan M, Dr. Upender P, Dr. Pritam Bhattacharjee, Dr. Prasanna Bharathi, Dr. Tanmoy Majumder, Dr. Dhanush R	Slot	TA2
Duration	90 Minutes	Max. Mark	50

General Instructions: Answer ALL the questions using appropriate diagram

- Write your registration number on the question paper in the box provided
- Do not write other information in the question paper.
- Only non-programmable calculator without storage is permitted

Q. No	Sub Sec	Description	Marks																																			
1.		<p>Apply a suitable probabilistic classification algorithm to the given dataset as shown in Table.1 and predict as to whether the given fruit is 'Apple' or 'Red Banana' or 'Others', when the known features are (Red, Sweet, long).</p> <p>Table 1:</p> <table border="1"> <thead> <tr> <th>Fruit</th><th>Red</th><th>Sweet</th><th>Bitter</th><th>Long</th><th>Short</th><th>Total</th></tr> </thead> <tbody> <tr> <td>Apple</td><td>350</td><td>450</td><td>150</td><td>0</td><td>100</td><td>650</td></tr> <tr> <td>Red Banana</td><td>400</td><td>300</td><td>150</td><td>350</td><td>300</td><td>400</td></tr> <tr> <td>Others</td><td>50</td><td>100</td><td>50</td><td>50</td><td>100</td><td>150</td></tr> <tr> <td>Total</td><td>800</td><td>850</td><td>350</td><td>400</td><td>500</td><td>1200</td></tr> </tbody> </table>	Fruit	Red	Sweet	Bitter	Long	Short	Total	Apple	350	450	150	0	100	650	Red Banana	400	300	150	350	300	400	Others	50	100	50	50	100	150	Total	800	850	350	400	500	1200	10
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2.		<p>Why is it required to reduce the number of features in machine learning? Apply a suitable dimensionality reduction technique to the following data set and reduce the number of features from 2 to 1.</p> <table border="1"> <thead> <tr> <th>Feature</th><th>Sample 1</th><th>Sample 2</th><th>Sample 3</th><th>Sample 4</th></tr> </thead> <tbody> <tr> <td>X</td><td>4</td><td>8</td><td>13</td><td>7</td></tr> <tr> <td>Y</td><td>11</td><td>4</td><td>5</td><td>14</td></tr> </tbody> </table>	Feature	Sample 1	Sample 2	Sample 3	Sample 4	X	4	8	13	7	Y	11	4	5	14	15																				
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3.	(i)	With increased usage of smartphones, sensors and heterogeneous devices, IoT applications handle huge volumes of data. Identify the diverse challenges that this enormous network would face in terms of services, security and data computation. Suggest suitable solutions. 5
	(ii)	Suggest a suitable AWS IoT architecture to resolve the above-said challenges. Elaborate on the design considerations involved using appropriate diagrams. 5
4.	(i)	With increasing smart applications, how are the resources effectively allocated to the changing needs of the customer? Illustrate using suitable challenges and solutions. 5
	(ii)	How are resource intensive applications handled to reduce latency overhead? Illustrate using suitable challenges and solutions. 5
5.		How are technologies used to simulate human intelligence and decision making? How would user input and user interaction improve the future of smart devices? 5

*****All the best*****