



VIT[®]

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF ADVANCED SCIENCES

Winter Semester 2023-2024

Continuous Assessment Test – 2

Programme Name & Branch: B.Tech

Slot: G1+TG1 (Common)

Course Name & code: Probability and Statistics & BMAT202L

Exam Duration: 90 Min.

Maximum Marks: 50

Answer ALL Questions

Q.No.	Question	Max Marks																											
1.	<p>The following data show the number of bedrooms, the number of baths, and the prices at which a random sample of eight family houses sold recently in a certain large housing development:</p> <table><tr><td>No. of bedrooms <i>X₁</i></td><td>3</td><td>2</td><td>4</td><td>2</td><td>3</td><td>2</td><td>5</td><td>4</td></tr><tr><td>No. of baths <i>X₂</i></td><td>2</td><td>1</td><td>3</td><td>1</td><td>2</td><td>2</td><td>3</td><td>2</td></tr><tr><td>Price (dollars)</td><td>78800</td><td>74300</td><td>83800</td><td>74200</td><td>79700</td><td>74900</td><td>88400</td><td>82900</td></tr></table> <p>Use the method of least squares to find a linear equation which will enable us to predict the average sales price of a family house in the given housing development in the terms of the number of bedrooms and the number of baths.</p>	No. of bedrooms <i>X₁</i>	3	2	4	2	3	2	5	4	No. of baths <i>X₂</i>	2	1	3	1	2	2	3	2	Price (dollars)	78800	74300	83800	74200	79700	74900	88400	82900	10
No. of bedrooms <i>X₁</i>	3	2	4	2	3	2	5	4																					
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Price (dollars)	78800	74300	83800	74200	79700	74900	88400	82900																					
2.	<p>(a) A multiple choice test consist of 8 question with 3 option of each question in which only one is correct. A student answer each question by rolling a balanced die and checking the first answer if he gets 1 or 2, the second answer if he get 3 or 4 and the third answer if he get 5 or 6. To get a distinction, the student must secure atleast 75%</p>	5+5																											

1.9667.

0.01966

	<p>correct answer. If there is no negative marking, what is the probability that the student secures a distinction?</p> <p>(b) The mean number of bacteria per millilitre of a liquid is known to be 6. Find the probability that in 1 ml of the liquid, there will be: (a) 0, (b) 1, (c) 2, (d) 3, (e) less than 4, (f) 6 bacteria</p>	
3.	<p>In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find (i) how many students score between 12 and 15? (ii) how many score above 18? (iii) how many score below 18?</p>	10
4.	<p>500 articles from a factory are examined and found to be 2% defective. 800 similar articles from a second factory are only found to be 1.5% defective. Can it reasonably be concluded that the products of the first factory are inferior to those of the second?</p>	10
5.	<p>The average marks scored by 32 boys is 72 with a SD of 8, while that for 36 girls is 70 with a SD of 6. Test at 1% LOS whether the boys perform better than girls.</p>	10