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 –II

Programme Name & Branch: B.Tech

Slot: G2 + TG2 (Common)

Course Name & code: Probability and Statistics & BMAT202L

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Answer ALL Questions

(Statistical Tables are allowed)

No	Question	Max Marks	CO	BL
1.	Find the linear relation of Sales on Advertisement expenditure and Advertisement expenditure on Sales from the data given below and hence estimate: 1. The Sale for advertising expenditure of $Rs.90$ lakhs 2. The advertisement expenditure for sales of $Rs.45$ crores Sales (Rs.Crores): 13, 16, 22, 20, 24, 30, 35 Adv. Exp. (Rs.Lakhs): 51, 64, 65, 71, 76, 80, 74	10	CO 3	BL3
2.	With usual notation, find p for a binomial random variate X if $n = 6$ and if $9P(X = 4) = P(X = 2)$. Hence find $P(X = 1)$.	10	CO 2	BL3
3.	The height X, of young Indian women is distributed normal with mean $\mu = 65.5$ and standard deviation $\sigma = 2.5$ inches. Find (i) $P(X < 67)$ (ii) $P(64 < X < 67)$ and (iii) $P(X > 65)$.	10	CO 2	BL3
4.	a) A group of cookery students is comparing two methods for preparing a dish: steaming and frying method. They want to know if patrons of their restaurant prefer their frying method over the steaming method. A sample of patrons are given the dish prepared using each method and asked to select their preference. A statistical	5	CO 4	BL4

	analysis is performed to determine if more than 50% of participants prefer the new frying method: $H0 : p = 0.50,\ H1 : p > 0.50$ Discuss Type I and Type II error and their consequences for this scenario. b) A Telecom service provider claims that individual customers pay on an average $Rs.400$. per month with standard deviation of $Rs.25$. A random sample of 50 customers' bills during a given month is taken with a mean of $Rs.250$ and standard deviation of $Rs.15$. Test the hypothesis against the claim made by the service provider. Assume LOS 1%.	5		
5.	Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same or not. Assume 5% LOS.	10	CO 4	BL4