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 : **D1+TD1 (Common)**

Course Name & Code : **Probability and Statistics & BMAT202L**

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

General instruction(s): Answer ALL Questions

(Statistical Table is to be permitted)

Q.No	Question	Max Marks
1.	Obtain the equations of the regression lines from the following data. Also estimate the values of (i) Y, when X=38 and (ii) values of X, when Y=18.	10
2.	In a certain factory producing razor blades, there is a small chance 0.002 for any blade to be defective. The blades are supplied in packets of 10. Use Poisson distribution to calculate the approximate number of packets containing (i) no defective blade, (ii) at least one defective blade and (iii) at most 1 defective blade in a consignment of 10000 packets.	10
3.	The lifetime X (in hundreds of hours) of a certain type of vacuum tube has a Weibull distribution with parameters $\alpha=2$ and $\beta=3$. Compute the following: (i) E(X) and Var(X), (ii) $P(X\leq 6)$, (iii) $P(1.8\leq X\leq 6)$ and (iv) $P(X\geq 3)$.	10
4.	A random sample of 100 recorded deaths in the United States during the past year showed an average life span of 71.8 years. Assuming a population standard deviation of 8.9 years, does this seem to indicate that the mean life span today is greater than 70 years at 0.05 level of significance.	10
5.	In a referendum submitted to the student body at a university, 850 men and 566 women voted. 530 of the men and 304 of the women votes yes. Does this indicate a significant difference of the opinion on the matter between men and women students?	10

X	22	26	29	30	31	31	34	35
Y	20	20	21	29	27	24	27	31