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

Vellore – 632014, Tamil Nadu, India
DEPARTMENT OF MATHEMATICS
SCHOOL OF ADVANCED SCIENCES
WINTER SEMESTER 2022-2023

CONTINUOUS ASSESSMENT TEST –II

Programme Name & Branch	**: B.Tech**
Course Code	**: BMAT202L**
Course Name	**: Probability and Statistics**
Slot	**:D2+TD2**
Date of the Examination	**:15-03-2023**
Duration	**: 90 minutes**

Max. Marks : 50

General instruction(s): i) Statistical tables are permitted

ii) *OPEN BOOK Examination*

Q. No	Question	Marks
1. (i)	A random sample of recent repair jobs was selected and estimated cost and actual cost were recorded Estimated Cost: 300, 450, 800, 250, 500, 975, 475, 400 Actual cost: 273, 486, 734, 297, 631, 872, 396, 457 Calculate the value of Spearman's rank correlation coefficient, Interpret the value obtained.	5
(ii)	The following table gives age (X) (in years) of cars and annual maintenance cost(Y)(in hundred rupees) X: 1, 3, 5, 7, 9 Y: 15, 18, 21, 23, 22 Estimate the maintenance cost for a 4-year old car after finding the regression equation	5
2.	After correcting the proofs of the first 50 pages of a book, it is found that on the average there are 3 errors per 5 pages. Use Poisson probabilities and estimate the number of pages with 0,1,2,3 errors in the whole book of 1000 pages	10

3.(i)	The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs.40.Assuming that the account balances are normally distributed, (a) what proportion of accounts is over Rs.150? (b) what proportion of accounts is between Rs.100 and Rs.150?	5
(ii)	The length of time for one individual to be served at a cafeteria is a random variable having an exponential distribution with a mean of 4 minutes. What is the probability that a person is served for (i) less than 3 minutes? (ii) greater than 4 minutes?	5
4.	Random samples of 400 men and 600 women were asked whether they would like to have a fly-over near their residence. 200 men and 325 women were in favour of it. Test the equality of proportion of men and women in the proposal at 5% and 1% level of significance.	10
5.	An automatic machine fills tea in sealed tins with mean weight of 1kg and standard deviation of 1gm . A random sample of 50 tins was examined and it was found that their mean weight was 999.50 gms. (i)Is the machine working properly at 5% level of significance? (ii)Find 95% confidence limits for the mean weight of all tea tins	10

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