

B. TECH.**(SEM IV) THEORY EXAMINATION 2017-18****ELEMENTARY MATHEMATICS-III****Time: 3 Hours****Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION-A**

1. Attempt all questions in brief.

2 × 10 = 20

- (a) Explain Histogram chart in brief.
- (b) What is the difference in classification and tabulation?
- (c) What is the mean variance of Poisson distribution?
- (d) What is the additive law of probability?
- (e) Prove that correlation coefficient and regression coefficients have same sign.
- (f) What is the range of correlation coefficient?
- (g) Explain testing a hypothesis in brief.
- (h) Define standard error.
- (i) Explain np chart in brief.
- (j) Define Latin cubes.

SECTION-B2. Attempt any **THREE** of the following.**10 × 3 = 30**

- (a) The first four moments of a distribution about $X=2$ are -2, 12, -20 and 100. Calculate the moments about mean. Also calculate β_2 and show whether the distribution is leptokurtic or platykurtic.
- (b) A fair dice is tossed twice. Find the probability of getting a 4, 5 or 6 on the first toss and a 1, 2, 3 or 4 on the second toss.
- (c) Given the following data:

X	6	2	10	4	8
Y	9	11	5	8	7

Find the two regression equations and calculate the standard error of the estimate (S_{xy} and S_{yx}).

- (d) In an experiment on pea-breeding Mendel obtained the following frequencies of seed: 315 round and yellow, 101 wrinkled and yellow, 108 round and green, 32 wrinkled and green. According to his theory of heredity the numbers should be in proportion 9: 3: 3:1. Is there any evidence to doubt the theory at 5 % level of significance?
- (e) A daily sample of 30 items was taken over a period of 14 days in order to establish control limits. If 21 defectives were found, what should be the upper and lower control limits of the proportion of defectives.

SECTION-C3. Attempt any **ONE** of the following:**10 × 1 = 10**

- (a) From the following data calculate Karl Pearson's coefficients of Skewness:

Marks More than	0	10	20	30	40	50	60	70	80
No. of Students	150	140	100	80	80	70	30	14	0

(b) The arithmetic mean and standard deviation of a series of 20 items were calculated by a student as 20 cm and 5 cm respectively. But while calculating, an item 13 was misread as 30. Find the correct arithmetic mean and standard deviation.

4. Attempt any **ONE** of the following.

10 × 1 = 10

(a) A student obtained the following answer to a certain problem given to him. Mean=2.4; Variance=3.2 for a binomial distribution. Comment on the result.

(b) State and Prove Baye's Theorem.

5. Attempt any **ONE** of the following.

10 × 1 = 10

(a) The correlation coefficients between two variables X and Y is 0.6. If $S_X = 1.50, S_Y = 2.00$, $\bar{X} = 10$ and $\bar{Y} = 20$ find the regression lines of: (i) Y on X (ii) X on Y

(b) Discuss the advantages of non parametric tests.

6. Attempt any **ONE** of the following.

10 × 1 = 10

(a) Perform a two-way ANOVA on the data given below:

Plots of Land	Treatment			
	A	B	C	D
I	38	40	41	39
II	45	42	49	36
III	40	38	42	32

(Use coding method subtracting 40 from the given numbers).

(b) Discuss the errors in testing a hypothesis.

7. Attempt any **ONE** of the following.

10 × 1 = 10

(a) Write the assumption in analysis of Latin square and what are the steps to construct a Latin square.

(b) Write short note on Randomized block design.