B.TECH
(SEM IV) THEORY EXAMINATION 2017-18
ELEMENTARY MATHEMATICS-III

Time: 3 Hours   *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION-A

1. Attempt all questions in brief. $2 \times 7 = 14$
   a.   Distinguish between primary and secondary data.
   b.   Explain significance of diagrams and graphs.
   c.   Write classical and empirical definition of probability.
   d.   Explain total Probability Theorem.
   e.   Write the range of correlation coefficient.
   f.   Explain sign test.
   g.   Explain np chart.

SECTION-B

2. Attempt any three of the following: $7 \times 3 = 21$
a.   Calculate arithmetic mean by direct and shortcut method.

Mark	20	30	40	50	60	70
No.	8	12	20	10	6	4

b.   A card is drawn at random from an ordinary pack of playing cards. Find the probability that
     (i) The card is king or a 10.
     (ii) The card is an ace of spade or a knave of dub.

c.   In a partially destroyed laboratory record of an analysis of correlation data, the following results are only legible variance of x = 9. Regression Equation: $8x – 10y + 66 = 0$; $40x – 18y = 214$
     From the above information,
     (i)   Find mean value of x and y.
     (ii)   Coefficient of correlation between x and y.
     (iii)   Slandered Derivation of y.

d.   The life limit of electric bulbs for a random sample of 10 from a large consignment gave the following value.

Item	1	2	3	4	5	6	7	8	9	10
Life in hours	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that average life limit of bulbs is 4,000 hours?

e. Write advantages and disadvantages of completely randomized design.

SECTION-C

3. Attempt any one part of the following: $7 \times 1 = 7$

a. The mean height of 25 male workers in a factory is 61 inches and the mean height of 35 female workers is 58 inches. Find the combined mean height of 60 workers in a factory.

b. Calculate median.

Less than 5	29	Less than 30	644
Less than 10	224	Less than 35	350
Less than 15	465	Less than 40	653
Less than 20	582	Less than 45	655
Less than 25	634	-	-

4. Attempt any one part of the following: $7 \times 1 = 7$

a. An urn contains 5 white and 11 back balls. One ball is drawn at random. Find the probability that it is white.

b. Two dice are thrown simultaneously. Find the probability
      (i) of getting an odd number on the first die.
      (ii) of throwing an ace on at least one of the dice.
      (iii) that the sum of number on the two dice is 7.
      (iv) that the sum is a multiple of four.
      (v) of getting doublets.

5. Attempt any one part of the following: $7 \times 1 = 7$

a. Calculate coefficient of Correlation, r_{12}:

Case	x_1	x_2	Case	x_3	x_4
A	10	9	E	12	11
B	6	4	F	13	13
C	9	6	G	13	13
D	10	9	H	9	4

b. Fit a straight line to the following data regarding x as the independent variable.

x	1	2	3	4	5
y	2.1	3.3	4.0	4.5	6.3

6. Attempt any one part of the following: $7 \times 1 = 7$

a. Define hypothesis and its types.

b. Calculation standard error of mean from the following calculate on the occasion of Durga Puja.

Mid Value (`)	39	49	59	69	79	89	99
No of limits	2	3	11	20	32	25	7

7. Attempt any one part of the following: $7 \times 1 = 7$

a. Analysis the following results of a Latin square experiment:

Column → Row ↓	1	2	3	4
1	A (12)	D (20)	C (16)	B (10)
2	D (18)	A (14)	B (11)	C (14)
3	B (12)	C (15)	D (19)	A (13)
4	C (16)	B (11)	A (15)	D (20)

The letters A, B, C and D denote the treatments and the figures in brackets denote the observation.

b. Write advantages of statistical quality control.