PAPER ID-421365

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM IV) THEORY EXAMINATION 2021-22
ELEMENTARY MATHEMATICS-III

Time: 3 Hours ***Total Marks: 70***

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

SECTION A

1. Attempt *all* questions in brief. 2x7 = 14

a.	How can we measure Kurtosis?
b.	For a Binomial distribution, mean is 6 and variance is 4. Determine q.
c.	If X and Y try to solve a problem with probability 1/3 and 3/4 respectively. Determine the probability that the problem will not be solved.
d.	If both the regression lines are 8x-10y+66=0, 40x-18y=214 calculate the correlation coefficient.
e.	Write student's t-test?
f.	What you mean by null hypothesis?
g.	Write the control limits of C charts.

SECTION B

2. Attempt any *three* of the following: 7x3 = 21

a.	The first four moments of a distribution about the value 4 are -1.5, 17, -30 and 308. Find the moments about the mean .
b.	A can hit the target 4 times in 5 shots; B 3 times in 4 shots; C twice in 3 shots. They fire a volley. Evaluate the probability that at least two shots hit?
c.	Calculate the correlation coefficient for the following data:

x	15	20	27	13	45	60	20	75
y	50	30	55	30	25	10	30	70

d.	A sample of 20 items has mean 42 units and S.D. 5 units. Discuss that it is a random sample from a normal population with mean 45 units. t for 19 degree of freedom at 5% level of significance is 2.09.
e.	Write a short notes of hypothesis test?

SECTION C

3. Attempt any *one* part of the following: 7x1 = 7

a. Calculate the median for the following frequency distribution:

x	1	2	3	4	5	6	7	8	9
f	8	10	11	16	20	25	15	9	6

b.

4. Attempt any *one* part of the following: 7x1 = 7

a. Fit a poisson distribution to the following data and calculate theoretical frequencies

Deaths	0	1	2	3	4
Frequencies	122	60	15	2	1

b. Six dice are thrown 729 times. Evaluate the expectation of at least three dice to show a five or six?

PAPER ID-421365

Subject Code: RAS403

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM IV) THEORY EXAMINATION 2021-22
ELEMENTARY MATHEMATICS-III

5. Attempt any *one* part of the following: 7x1 = 7

a. Calculate the equations of the lines of regression for the data:

x	6	2	10	4	8
y	9	11	5	8	7

b. Explain test.

6. Attempt any *one* part of the following: 7x1 = 7

a. The following table gives the death records of three hospitals

Hospital A	3	4	3	5	0
Hospital B	6	3	3	4	4
Hospital C	7	3	4	6	5

From these data. Discuss about the difference in the Number of the deaths per months among three hospitals. Given that the tabulated value of F for 2 and 12 degrees of freedom is 3.88 at 5% level of significance

b. To test the effectiveness of inoculation against cholera, the following table was obtained:

	Attacked	Not attacked	Total
Insoculated	30	160	190
Not inoculated	140	460	600
Total	170	620	790

(The figures represent the number of persons) Use chi-square test to defend or refute the statement that the inoculation prevents attack from cholera. (given value of χ^2 at 5% level of significance for 1 d.f. is 3.841)

7. Attempt any *one* part of the following: 7x1 = 7

a. What is randomized block design explain with examples?

b. Distinguish between p chart and np chart. Following is the data of defective of 10 samples of size 100 each. Construct np chart and explain your comments regarding the process.

sample	1	2	3	4	5	6	7	8	9	10
defective	6	9	12	5	12	8	8	16	13	7