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EAS402

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199404

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

STATISTICAL TECHNIQUES

Time : **3** Hours] [Total Marks : **100**

Note : Attempt all questions.

1 Attempt any two parts of the following : **10×2=20**

(a) Explain Bar Diagram and Pie Diagram. Construct the pie-diagram for the following data :

	Children	Adults	Old	Total
City A	250	450	200	900
City B	1000	2250	350	3600

(b) Calculate mean, variance and standard deviation of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

(c) Calculate Karl Pearson's coefficient of skewness from the following data and comment on your result.

Age (in years)	0-1	1-2	2-3	3-4	4-5	5-6
No. of Children	15	17	19	27	19	12

2 Attempt any two parts of the followiing : **10×2=20**

(a) State the Additive Law of Probability. Two dice are thrown. Find the probability that the sum of faces is (i) 7 or 8 (ii) more than 8.

(b) State the Baye's Theorem.
There are 3 bags and they contain 2 white and 3 black balls; 3 white and 2 black balls; 4 white and 1 black balls respectively. The probability of selecting each bag is same. A bag is selected at random and a ball is drawn from it.
(i) Find the chance that a white ball is drawn.
(ii) If it is known that the ball is white, what is the probability that it come from second bag ?

(c) If the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals
(i) exactly 3
(ii) more than 2 individuals
(iii) none
(iv) more than one individual will suffer a bad reaction.

3 Attempt any two parts of the following : **10×2=20**

(a) The students got the following percentage of marks in Economics and Statistics.

Marks in Economics	78	36	98	25	75	82	90	62	65	39
Marks in Statistics	84	51	91	60	68	62	86	58	53	47

Calculate the coefficient of correlation

(b) You are given the following results for the heights (x) and weights (y) of 1000 policeman of U.P.

$M_x = 68$ inches, $M_y = 150$ lbs, $\sigma_x = 2.5$ inches, $\sigma_y = 20$ lbs, $r = 0.6$.

Estimate from the above data.
The height of a particular policeman whose weight is 200 lbs, and the weight of a particular policeman who is 6 feet tall.

(c) if $r_{12} = 0.70$, $r_{23} = 0.40$, $r_{31} = 0.60$, then find partial correlation coefficients $r_{12.3}$, $r_{23.1}$, $r_{31.2}$ and multiple correlation coefficient $R_{1.23}$.

4 Attempt any two parts of the following : **10×2=20**

(a) Quinine was administered to 812 persons out of a total population of 3248. The number of fever cases is shown below :

Treatment	Fever	No Fever
Quinine	20	792
No quinine	220	2216

Discuss the usefulness of quinine preventing malaria using X^2-test of significance.

(b) In two groups of ten children each increases in weight due to two different diets in the same period, were in pounds:

8	5	7	8	3	2	7	6	5	7
3	7	5	6	5	4	4	5	3	6

Find whether the variances are significantly different. The value of $F_{0.05}$ for (9,9) degrees of freedom is approximately 3.2.

(c) The varieties I, II, III of wheat were sown in four plots each and the following yields in quintals per acre were obtained :

I	7	5	5	3
II	2	5	4	4
III	8	4	6	7

Test the significance of difference between the yield of varieties. Given that 5% tabulated value of F for 2 and 9 degrees of freedom is 4.26.

5 Attempt any two parts of the following : **10×2=20**

(a) Define the design of experiments. What are the basic principles of field experimentation.

(b) What are the advantages and disadvantages of completely Randomized Design, Randomized block design and Latin Square Design.

(c) In the Latin Square experiment given below the yields in kilogram per plot on the wheat crop carried out for testing the effect of four manures A, B, C, D are given. Analyse the data :

A 10	B 9	C 12	D 11
C 11	D 12	A 10	B 10
D 11	C 9	B 10	A 11
B 9	A 13	D 9	C 11