

Roll No.

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F - 3963**B. C. A. (Part III) Examination, 2022****(New Course)****Paper First****Statistical Analysis****(301)***Time : Three Hours]**[Maximum Marks:80*

Note: Attempt any two parts from each question. All questions carry equal marks. Only simple calculators are allowed not scientific calculator.

Unit - I

1. (a) In how many ways can 4 boys and 4 girls sit around a circular table such that no two students sit side by side?
- (b) Prove that ${}^n C_r + {}^n C_{r-1} = {}^{n+1} C_r$

- (c) Find the constant term in the expansion of

$$\left(2x^2 - \frac{1}{x^2}\right)^8$$

Unit - II

2. (a) Define histogram and frequency polygon. Draw histogram and frequency polygon for the following table :

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	02	04	06	08	04

- (b) Find the median from the following data

Class	0-6	6-12	12-18	18-22	22-24	24-30	30-36	36-42
Freq- uency	05	11	25	20	15	18	12	06

- (c) Find the mean deviation from the arithmetic mean for the following frequency distribution:

Class	0-6	6-12	12-18	18-24	24-30
Frequency	8	10	12	9	5

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Unit - III

3. (a) A problem in statistics is given to three students A, B and C whose chances of solving are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ respectively. If they all try to solve the problem, what is the probability that the problem will be solved?
- (b) The chance of one event happening is the square of the chance of a second event happening, but the odds against the first are the cube of the odds against the second. Find the chance of happening of each.
- (c) A perfectly cubical die is thrown a large number of times in set of 8. The occurrence of 5 or 6 is called a success. In what proportion of the sets you expect 3 successes?

Unit - IV

4. (a) Calculate the Karl Pearson's coefficient of correlation between X and Y series :

X	17	18	19	19	20	20	21	21	22	23
Y	12	16	14	11	15	19	22	16	15	20

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- (b) Fit a second degree curve $y = a + bx + cx^2$ to the following data :

x	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

- (c) In 120 throws of a single die, the following distribution of faces was obtained :

Faces	1	2	3	4	5	6	Total
f_o	30	25	18	10	22	15	120

Do these results constitute of refutation of the "equal probability" null hypothesis?

Unit - V

5. (a) Define Monte Carlo Method and write its scopes and application areas.
- (b) Ten individuals are chosen at random from a population and their heights are found to be in inches :
63, 63, 64, 65, 66, 69, 69, 70, 70, 71.

Discuss the proposal that the mean height in the universe is 65 inches given that for 9 degrees of freedom the value of student's t at 5 percent level of significance is 2.262.

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- (c) Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results :

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Test whether you can discriminate between two horses. You can use the fact that 5 percent value of t for 11 degrees of freedom is 2.20.