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12425 3 Hours / 70 Marks

Seat No.

Instructions : (1) All Questions are *compulsory*.

- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

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1. Attempt any FIVE of the following :

- (a) The mean of 20 observation is 50. If the observation 50 is replaced by 140, what is new mean ?
- (b) If standard deviation of data is 9.5, mean of data is 21.6 & mode is 19.52, find Karl Pearson's coefficient of skewness.
- (c) Find Q_3 for the data :

33, 18, 24, 11, 59, 47, 61, 72

(d) Find Spearman's rank correlation coefficient for the data :

x 12 17 22 27 31 y 113 119 117 115 121

- (e) From 20 tickets marked 1 to 20, one ticket is drawn at random. Find probability that getting prime number.
- (f) An unbiased coin toss 6 time, find probability of getting at least two head.
- (g) A random sample of 50 items gives the mean 6.2, standard deviation 10.24 & population mean 5.4. Find value of standard normal variate z.



2. Attempt any THREE of the following :

(a) The average of marks obtained by group of 100 students in class is 30. The average of group of male & female is 27 & 32. Calculate the composition of the group.

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(b) Find median for data :

C.I. 9-19 20-29 30-39 40-49 50-59

- fi 8 9 16 4
- (c) Find mode graphically :

C.I. 146-155 156-165 166-175 176-185 186-195 fi 5 7 14 6 4

(d) Karl Pearson's coefficient of skewness of distribution is 0.33, standard deviation is 6.5 & mean is 29.6. Find mode & median.

3. Attempt any THREE of the following :

- (a) Calculate the coefficient of skewness :
 - x 4 5 8 9 7 f 3 6 10 10 5
- (b) Calculate Bowley's coefficient of skewness :

0 1 2 3 4 5 6 xi fi 15 20 14 25 13 8 04

(c) Find the straight line y = a + bx for the data :

x 0 1 2 3 4 y 1 2.9 4.8 6.7 8.6

(d) Calculate coefficient of correlation of x & y.

$$\Sigma x^2 = 138,$$
 $\Sigma y^2 = 136,$ $\Sigma xy = 122$

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4. Attempt any THREE of the following :

(a) Find Spearman's rank correlation coefficient :

x	2	4	6	8	10	12
у	3	6	4	5	8	9

(b) Find the regression line for following data :

 x
 6
 2
 8
 3
 5

 y
 9
 11
 5
 8
 7

- (c) In college hostel there are 75 students out of which 15 students & 40 students like to drink tea & coffee. 20 students like neither tea nor coffee. Two students from this hostel come to canteen. Find the probability that both will order the same drink.
- (d) Five men in a company of 20 are graduates. If 3 men are picked up out of 20 at random, find the probability that

(a) all graduate (b) at least one graduate.

(e) A husband & wife appeared in an interview for two vacancies in office. P(H) = 1/7 & P(W) = 1/5. Calculate probability that one of them is selected.

5. Attempt any TWO of the following :

- (a) In a certain factory turning out razor blades, there is a small chance of 0.002 to be defective. The blades are supplied in a packet of 10. Use Poisson distribution to calculate the approximate number of packets containing
 - (i) No defective
 - (ii) One defective
 - (iii) Two defective

blades in a consignment of 10,000 packets.

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- (b) If 20% of the bolts produced by machine are defective, find probability that out of 4 bolts drawn one is defective.
- (c) In a sample of 1000 case, $\bar{x} = 14$ & $\sigma = 2.5$. Assuming normal distribution, find how many student score between 12 & 15. Given A(0.8) = 0.2881, A(0.4) = 0.1554.

6. Attempt any TWO of the following :

- (a) A fertilizer machine is set to give 12 kg of nitrate for quintal bag fertilizer. Ten 100 kg bags are examined. The percentage of nitrate per bag are as follows : 11, 14, 13, 12, 13, 12, 13, 14, 11, 12. Calculate t distribution. State machine is defective (t for g degree of freedom is 2.262)
- (b) The number of road accident met with the taxi driver is follow's Poisson distribution with mean 2 out of 5000. Find number of taxi driver(a) not meet accident (b) more than 3 accident.
- (c) To test effectiveness of inoculation against cholera :

	Attached	Not Attached	Total
Inoculated	40	150	190
Not Inoculated	130	470	600
Total	170	620	790

Calculate χ^2 & state prevents attack of cholera $\chi^2_{0.05}$, l = 3.8411.

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