

DD-114

December-2013

5 Years M.Sc. (CA & IT) Integrated (KS) 3rd Sem. SY. M.Sc.**Computer Oriented Statistical Methods****Time : 3 Hours]****[Max. Marks : 100**1. Attempt any **two** : **20**

- (A) (i) An incomplete distribution of income of 167 persons is given below. If the mode of the distribution is ₹ 1360 find the missing frequencies : **5**

Monthly Income	Persons
0-400	4
400-800	12
800-1200	?
1200-1600	50
1600-2000	?
2000-2400	13
2400-2800	9
2800-3200	4

- (ii) The weighted geometric mean of the four numbers 8, 25, 17 and 30 is 15.3 if the weighted of the first three numbers are 5, 3 and 4 respectively. Find the weight of the 4th numbers. **5**

- (B) (i) Two brands of tyres are tested with the following results : **5**

Life (in '000 miles)	No. of tyres of brands	
	X	Y
20-25	1	0
25-30	22	24
30-35	64	76
35-40	10	0
40-45	3	0

- (a) Which brands of the tyres have greater average life ?
- (b) Compare the variability and state which brand of tyres would you use on your fleet of trucks ?
- (ii) The mean and standard deviation of 200 items are found to be 60 and 20 respectively. If at the time of calculation two items were wrongly taken as 3 and 67 instead of 13 and 17, find the correct mean and standard deviation. What is the correct coefficient of variation ? **5**
- (C) (i) Distinguish between Karl Pearson's and Bowely's measures of skewness. Which one of these would you prefer and why ? **5**

- (ii) For the following distribution calculated the first four central moments and two beta coefficients :

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Class Interval	Frequency
20-30	5
30-40	14
40-50	20
50-60	25
60-70	17
70-80	11
80-90	8

2. (A) Calculate the coefficient of correlation between the age of husbands and wives from the following tables :

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Age of wives (years)	Age of husbands (years)					
	20-30	30-40	40-50	50-60	60-70	Total
15-25	5	9	3	-	-	17
25-35	-	10	25	2	-	37
35-45	-	1	12	2	-	15
45-55	-	-	4	16	5	25
55-65	-	-	-	4	2	6
Total	5	20	44	24	7	100

- (B) From the data given below find :

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- The two regression coefficient.
- The two regression equation.
- The coefficient of correlation between the marks in economics and statistics.
- The most likely marks in statistics when marks in economics are 30.

Marks in Economics	Marks in Statistics
25	43
28	46
35	49
32	41
31	36
36	32
29	31
38	30
34	33
32	39

3. Attempt any **two** :

- (A) (i) A committee of four has to be formed from among 3 economists, 4 engineers, 2 statisticians and 1 doctor.
- What is the probability that each of the four professions is represented on the committee ?
 - What is the probability that the committee consists of the doctors and atleast one economist ?

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- (ii) In a certain college the students engage in various sports in the following : 5
Proportion :

Football	60% of all student
Basketball	50% of all student
Both Football and Basket ball	30% of all student

If a student is selected at random, what is the probability that he will

- (a) Play football or basket ball
(b) Play neither sport ?
- (B) (i) In a village 'A' out of a random sample of 1000 persons, 100 were found to be vegetarian while in another village 'B' out of 1500 persons 180 were found to be vegetarian. Do you find a significant difference in the food habits of the people of the two villages ? 3
- (ii) In a Big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers ? 3
- (iii) Given the following information relating to two places A and B, test whether there is any significant different between their mean wages : 4

	A	B
Mean Wages	47	49
Standard Deviation	28	40
Numbers of Workers	1000	1500

- (C) Obtain the seasonal indices by the link relative method for the following data : 10

Average Quarterly price of a commodity					
Quarter	Years				
	1996	1997	1998	1999	2000
I	30	35	31	31	34
II	26	28	29	31	36
III	22	22	28	25	26
IV	31	36	32	35	33

4. (A) (i) A Dice is tossed twice getting a numbers greater than 4 is considered a success. Find the mean and variance of the probability distribution of the numbers of success. 5
- (ii) The following mistake per page were observed in a book. 5

No. of mistakes per page	No. of times the mistake occurred
0	211
1	90
2	19
3	5
4	0

Fit Poisson distribution to fit Data.

- (B) A sales tax officer has reported that the average sales of the 500 business that he has to deal with during a year amount to ₹ 36,000 with a standard deviation of ₹ 10,000 assuming that the sales in these business are normally distributed. Find : **10**
- The numbers of business the sales of which are over ₹ 40,000.
 - The percentage of business the sales of which are likely to range between ₹ 30,000 and ₹ 40,000.
 - The probability that the sales of business selected at random will be over ₹ 30,000.

Proportion of area under the normal curve

Z	0.25	0.40	0.50	0.60
Area	0.0987	0.15554	0.1915	0.2257

5. (A) Attempt any **two** : **10**

- It is found that 35 of 250 housewives in Delhi 22 of 220 house wives in Mumbai and 39 of 300 housewives in Chandigarh watch atleast one talk show every day. At the 0.05 level of significance test that there is no difference between the true proportions of housewives who watch talk shows in these cities.

(Value of X^2 for 2 d.f. is 5.991)

- Test the significant of the difference between two value using Fisher's Z transformation.

Sample Size	Value of r
5	0.870
12	0.560

- How many pair of observation must be included in a sample in order that an observed correlation coefficient of value 0.42 shall have a calculated value of t greater than 2.72 ?

- (B) A manufacturing company has purchases 3 new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output, five hourly production figures are observed at random from each machines and the result are given below : **10**

Observation	A1	A2	A3
1	25	31	24
2	30	39	30
3	36	38	28
4	38	42	25
5	31	35	28

Use analysis of variance and determine whether the machines are significantly different in their main speed

(Given at 5% level $f_{2,12} = 3.89$)