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VCD SYIT SEM -IV COST 75 MARKS 2 ½ HRS

NOTE –

- All questions are compulsory .
- Rignt indicate full marks
- Scientific calculator is allowed

Q.1 Attempt (Any Three) (15)

a) Calculate Median and Mode with the help of given data

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	14	23	27	21	32	30

b) Write a difference between Harmonic mean and Geometric mean

c) Calculate $Q_1 and\ Q_3$ from the following data

Marks	0-10	10-20	20-30	30-40	40-50
No .of Students	8	6	5	13	28

d) Calculate $D_7\ and\ P_{35}$

X	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f	7	18	25	30	20	8	11	22

e) Calculate Standard Deviation and coefficient of variance from the following data

Size	7	8	9	10	11	12
Frequency	13	13	7	18	5	4

f) The number examined ,the mean weight and the S.D in each group of examination and two medical examiner are given below . Find the mean weight and S.D of both group taken together

Medical	Number examined	Mean Weight	S.D
A	50	113	6.5
B	60	120	8.5

Q.2 Attempt (Any Three) (15)

a) The first four raw moments about origin are 4,16,33,89 .Find mean and the first four central Moments.

b) Find the first four central moments from the following data also find β_1, β_2 Skewness and Kurtosis

X	5	10	15	20	25	30	35
f	8	15	20	32	23	17	5

c) Write a short note on Kurtosis .

d) From 40 tickets from 1 to 40 . One ticket is drawn at random .Find the probability that it is marked with a multiple of 3 and 4.

e) A population consists of the five numbers 3 , 4 , 7 ,9 and 12 Consider all possible sample of size 2 that can be drawn with replacement from this population ,evaluate i) Mean of the population ii) Standard deviation of the population iii) The mean of the sampling distribution of means iv) Standard deviation of the sampling distribution of means .

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f) The following data are given to an economist for the purpose of economics analysis The data refer to the length of a certain type of batteries

n=100 , $\sum fd = 50 \sum fd^2 = 1970 \sum fd^3 = 2948 \sum fd^4 = 86752$,in which d = (X-48) . Do you think that distribution is platykurtic ?

Q.3 Attempt (Any Three) (15)

a) A sample of 60 typical round trips of a truck of a transport company showed the mean time of 50 hours with S.D of 4 hrs. .Find the limits within which the mean required for the round trip lies almost certainly .

b) For a certain test for coin , $H_0 : P = \frac{1}{2} against\ H_1 : P = \frac{1}{3}$ can be retained where P represent the probability of getting a tail .To decide this coin is tossed four times and H_0 reject only if the number of heads observed 0 or 1 .Find the probability of both types of error .

c) Two sample of 150 and 250 balls drawn from two different lots gave 5% and 9% defective balls respectively . Test whether both the lots come from the balls manufactured by same process.

d) A random sample of 500 men is found to have mean height of 69.2 inches and standard deviation of 2.7 inches Find i) 95% confidence limit ii) 99% confidence limit .

e) Define -i) Level of significance ii) Probable error iii) Standard Error iv) Critical region

v) One tail and two tail

f) A company has the head office at Dadar and a branch at Virar . The personal director wantated to know if the workers at the two places would like the introduction of a new plan of work and a survey was conducted for this purpose . Out of sample of 500 workers at Dadar ,62% favoured the new plan at Virar , Out of sample of 400 workers 41% were against the new plan Is there any significant difference between the two groups in their attitude towards th new plan at 5% level ?

(Given Z = 1.96 at 5%)

Q.4 Attempt (Any Three) (15)

a) A certain medicine was given to each of the 5 patients . The results are given below

	I	II	III	IV	V
Weight before medicine	42	37	50	60	41
Weight after medicine	35	45	48	65	42

Test whether there is any change in weight after the medicine at 5% level of significance

(Given t at 5% is 2.78)

b) The following data represents the last digit of the cars passing at a certain traffic signal observed during last 30 minutes for 180 cars. Can we retain at 5% level of significance that all the digits are equally likely to occur? ($x^2 at\ 5\% = 16.9190\ when\ v = 9$)

Last digit	0	1	2	3	4	5	6	7	8	9
Frequency	12	20	14	12	21	18	17	26	19	21

c) In an experiment of immunization of cattle from tuberculosis the following result were obtained

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	Affected	Unaffected	Total
Inoculated	11	31	42
Not inoculated	14	4	18

Examine the effective of vaccine in control the incidence of the diseases at 1% level of significance (Given $x^2 at\ 1\% = 6.635$)

d) Examine whether the nature of the area is related to voting performance in this election with the help of given data (Given $x^2 at\ 5\% = 3.84$)

Area	Voters		Total
	A	B	
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

e) Using the data given table to decide whether we can conclude that standard of a salesman has a significant effect on hid performance in field selling at 5% level of significance

	Performance in field			Total
	Disappointing	Satisfactory	Excellent	
Poor dressed	21	15	6	42
Well dressed	24	35	26	85
Very well dressed	35	80	58	173
Total	80	130	90	300

(Given $x^2 at\ 5\% = 9.488$)

f) A random sample of 10 girls had the following I.Q.70,120,110,101,85,83,96,107,100,96 Do the data support the assumption of a population mean I.Q. 100? Find a reasonable range in which most of the mean I.Q. values of sample of 10 girls lie . (Given t at 5% =2.26)

Q.5 Attempt (Any Three) (15)

a) Find the equation of straight line by least square method

X	2	3	4	5	6	7	8
Y	0.1	0.3	0.5	0.7	0.8	1.1	1.3

b) Find the regression equation X on Y and regression coefficient with the help of given data

X	2	4	5	6	8	11	12
Y	18	12	10	8	7	5	4

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c) Find the Spearman's Rank with the help of given data

Marks in Maths	35	49	50	75	32	89	65	70	45
Marks in Stat	30	23	48	88	49	66	20	35	48

d) Find the equation of second degree of parabola with the help of given data

X	1	2	3	4	5	6	7
Y	0.1	0.3	0.5	0.7	03*	1.1	1.8

e) Fit an exponential curve of the form $y = ab^x$ to the following data

X	1	2	3	4	5	6	7	8
Y	1	1.2	1.8	2.5	3.6	4.7	6.6	9.1

f) Find Total variation and explained variation and unexplained variation with the help of given data

X	65	63	67	64	68	62	70
Y	68	66	68	65	69	66	68