Government of Karnataka

Department of pre-University Education

STATISTICS QUESTION BANK

For **First Year P U C**

2017

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Features of the Question Bank

For the first time Pre-University Department has been released the Question Bank for the First Year PUC Statistics.

First Year PUC Statistics Text Book contains 10 units

The questions in the Question Bank are framed for all the units on the basis of the text book.

Following is the pattern of the Question Bank.

Section A-each question carries one mark.

Section B – each question carries two marks.

Section C – each question carries five marks.

Section D- each question carries ten marks.

Section E- each question carries five marks (Practical - oriented questions).

Tests, Mid-term and Annual Examination Question Papers should be based on this Question Bank.

Model Question Papers are given at the end of the question bank.

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Reference: Prescribed Text Book

Disclaimer: The question bank is prepared for the benefit of students and teachers. The committee worked for the preparation of question bank made all efforts to make comprehensive and foolproof. However, if any mistakes, errors found, pl mail at questionbank.pue@gmail.com, academic.pue@gmail.com. There is no guarantee that questions from this question bank only appear in the examination conducted by the department.

QUESTION PAPER PATTERN FOR I P.U.C

Sub: STATISTICS (31)

Duration: 3 Hours 15 Minutes — Maximum Marks : 100

I.	Answer any 10 questions out of 12 questions. [Q No 1 to 12] : (VSA)	10/12 X 1 = 10/12
II.	Answer any 10 questions out of 12 questions. [Q No 13 to 24] : (SA)	10/12 X 2 = 20/24
III.	Answer any 08 questions out of 12 questions. [Q No 25 to 36] : (LA)	08/12 X 5 = 40/60
IV.	Answer any 02 questions out of 04 questions. [Q No 37 to 40] : (ET)	2/4 X 10 = 20/40
V.	Answer any 02 questions out of 04 questions. [Q No 41 to 44] : (LA)	2/4 X 5 = 10/20
		Total : 32/44 100/156

Unit No	Unit Name	No of Teaching Hours			Marks Allotted	% weightage of Marks	Number of Questions					
		Th	Pr	Tot			VSA	SA	LA	ET	LA	Tot
I	Introduction to Statistics and some basic concepts	7	-	7	8	5	1	1	1			3
II	Organization of data	7	-	7	8	5	1	1	1			3
III	Classification and Tabulation of data	10	8	18	16	10	2	2	1		1	6
IV	Diagrammatic and Graphical representation of data	10	8	18	16	10	2	2	1		1	6
V	Analysis of univariate data	25	10	35	36	23	2	2	1	2	1	8
VI	Analysis of bivariate data	15	6	21	23	15	1	1	2	1		5
VII	Association of attributes	5	1	6	7	4	-	1	1			2
VIII	Interpolation and Extrapolation	5	1	6	6	4	1	-	1			2
IX	Theory of Probability	14	2	16	18	12	1	1	2	a	x	4+
X	Random Variable and Mathematical expectation	14	4	18	18	12	1	1	1	b		4+
	Total	112	40	152	156	100	12	12	12	4	4	44

Question Type	Marks
VSA: Very Short Answer	1
SA : Short Answer	2
LA : Long Answer	5
ET : Essay Type	10

Note: 1. One 10 mark question and one 5 mark question (i.e., questions a, b and x) are to set from combination of untis IX and X covering both units.

2. Two theory, eight problems and two proff oriented questions should be given in section-C.

DEPARTMENT OF PRE-UNIVESITY EDUCATION

QUESTION BANK

I PU STATISTICS

Unit - I

INTRODUCTION - MEANING AND SCOPE

Section - A

One mark questions

1. Who is the father of Indian Statistics? (K)
2. Name the Latin word from which the term "STATISTICS" has been derived. (K)
3. Who defined STATISTICS as "the science of counting"? (K)
4. Define Bowley's definition of Statistics. (U)
5. Give Boddington's definition of Statistics. (U)
6. State Croxton and Cowden definition of Statistics. (K)
7. Does Statistics deal with individual data? (K)
8. Define population. (U)
9. Define sample. (U)
10. Define qualitative characteristic. (U)
11. Define quantitative characteristic. (U)
12. Define attribute. (U)
13. Give an example for attribute. (U)
14. Define variable. (U)
15. Define discrete variable. (U)
16. Give an example for discrete variable. (U)
17. Define continuous variable. (U)
18. Give an example for continuous variable. (U)
19. Define nominal scale. (U)
20. Define ordinal scale. (U)

Section - B

Two marks questions

21. Write down Prof.Horace Secrist's definition of Statistics. (U)
22. Mention two characteristics of Statistics. (K)
23. Mention two functions of Statistics. (K)
24. Mention two limitations of Statistics. (K)
25. Mention two fields where Statistics is used. (K)
26. Mention two causes of distrust of Statistics. (K)
27. Mention two remedies to remove distrust of Statistics. (K)
28. Define population and sample. (U)
29. Distinguish between qualitative and quantitative characteristics. (U)
30. Define attribute. Give an example. (U)
31. Define variable. Give an example. (U)
32. Define discrete variable with the help of an example. (U)

33. Define continuous variable with the help of an example. (U)
34. Mention the type of variable seen in
    (a) Daily temperature. (b) Size of shoes. (K)
35. What is meant by nominal and ordinal scales? (K)

Section - C

Five marks questions

36. Define Horace Secresit's definition of Statistics. Explain any two of them. (U)
37. Mention five characteristics of Statistics. (K)
38. Mention five functions of Statistics. (K)
39. Mention three functions and two limitations of Statistics. (K)
40. Mention five limitations of Statistics. (K)

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Unit - II

ORGANIZATION OF DATA

Section - A

One mark questions

1. What is meant by statistical enquiry? (K)
2. Who is an investigator? (K)
3. Who is enumerator? (K)
4. Who is respondent? (K)
5. Define collection of data. (U)
6. Define primary data. (U)
7. What is a questionnaire? (K)
8. What is a schedule? (K)
9. Define secondary data. (U)
10. Give an example for published source of secondary data. (U)
11. Give an example for unpublished source of secondary data. (U)
12. Define census enumeration. (U)
13. Define sample survey. (U)
14. What is pilot survey? (K)
15. Define sampling. (U)
16. What is meant by simple random sampling? (A)
17. What is meant by sampling (Statistical) error? (K)
18. What is meant by absolute error? (Define absolute error) (K)
19. What is meant by relative error? (Define relative error) (K)
20. When the sampling errors are decreases? (K)

Section - B

Two marks questions

21. Mention the two stages of statistical enquiry. (K)
22. What is primary data? Mention a method of collecting the same. (K)
23. Mention two methods of collecting primary data. (K)
24. Mention the sources of secondary data. (K)

25. Mention a merit and demerit of census enumeration. (K)
26. Mention a merit and demerit of sample survey. (K)
27. Mention two methods of sampling. (K)
28. Mention two causes of sampling errors. (K)
29. Distinguish between biased and unbiased errors. (U)
30. Mention the methods of measurement of errors. (K)

Section – C

Five mark questions

31. Mention the points that are to be considered in planning an enquiry. (K)
32. Mention the points that are to be considered in execution of the survey. (K)
33. Mention the merits and demerits of direct personal observation method of collecting primary data. (K)
34. What are the guidelines for the construction of a questionnaire? (K)
35. Mention any two merits and three demerits of census enumeration. (K)
36. Mention any three merits and two demerits of sample survey. (K)
37. Distinguish between census enumeration and sample survey. (U)
38. Briefly explain the three methods of sampling. (K)

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Unit - III

CLASSIFICATION AND TABULATION

Section - A

One mark questions

1. What is classification of the data? (K)
2. Mention an objective of classification of data. (K)
3. Define temporal classification. (U)
4. Define spatial classification. (U)
5. Define qualitative classification. (U)
6. Define quantitative classification. (U)
7. Define frequency. (U)
8. Define inclusive class interval. (U)
9. Define exclusive class interval. (U)
10. For what purpose correction factor is used, in frequency distribution? (K)
11. Define open-end class interval. (U)
12. What is class midpoint? (K)
13. Define frequency density. (U)
14. Define relative frequency. (U)
15. What is bi-variate frequency distribution? (K)
16. What is tabulation of the data? (K)
17. What is stub of a table? (K)
18. What is caption of a table? (K)

Section - B

Two marks questions

19. Differentiate between classification and tabulation. (U)
20. Mention two objectives of classification. (K)
21. What is chronological classification? Give an example. (U)
22. What is geographical classification? Give an example. (U)
23. Define qualitative classification with an example. (U)
24. Define quantitative classification with an example. (U)
25. Convert the flowing inclusive class intervals in to exclusive class intervals (A)

C - I	10 – 19	20 – 29	30 – 39	40 - 49

26. Mention two parts of a table. (K)
27. What are stubs and captions in a table? (K)

Section – C/E

Five marks questions

28. What are the principles (rules) of classification? (K)
29. What are the rules of tabulation? (K)
30. Number of teaching staff working in 20 different colleges was recorded as below:
    15, 12, 18, 10, 15, 12, 20, 25, 18, 10, 15, 12, 15 20, 25, 15, 18, 20, 15, 18
    Prepare a frequency table. (U)
31. The number of doctors serving in forty different hospitals were recorded as below :

6	7	5	7	6	3	9	8	6	7	5	7	6	8	5	8	5	9	5	6
5	9	6	6	4	4	7	5	5	8	5	3	3	8	4	4	3	4	4	3

    Prepare a discrete frequency table. (U)
32. In a survey of 40 families in a certain locality, the number of children per family was recorded and the following data were obtained.

1	0	3	2	1	5	6	2	2	1	0	3	4	2	5	6	3	2	1	1
3	3	2	4	2	2	3	0	2	1	4	5	3	3	4	4	5	4	2	1

    Represent the data in the form of a discrete frequency distribution. (U)
33. Following is the data regarding the number of meteors observed in 30 different days:
    7, 4, 2, 5, 9, 7, 4, 3, 8, 6, 9, 10, 3, 3, 5, 9, 5, 7, 6, 3, 8, 4, 3, 7, 9, 8, 10, 6, 8, 7.
    Classify the above observations. (U)
34. A review of the first 30 pages of a Statistics book reveals the following printing mistakes:

0	1	3	3	2	5	6	0	1	0	4	1	1	0	2
3	2	5	0	4	2	2	3	3	4	6	1	4	3	2

    Prepare a frequency distribution of printing mistakes. (U)
35. Following are the ages (in years) of school children:

12	5	13	12	10	11	7	9	6	10	9	13	5	10	7
14	6	11	13	7	9	8	11	10	8	12	13	9	6	14

    Prepare a frequency table using inclusive class interval of width 3 years. (U)

36. Following is the data regarding the I.Q of 30 children of a school.

106	118	112	120	103	105	99	139	65	113
100	108	100	112	110	109	117	98	103	99
108	116	93	100	120	110	95	101	105	98

Prepare a frequency distribution with class intervals: < 90, 90-110, 110-120, ≥ 120. (U)

37. From the following data of the hourly wages (in rupees) of workers employed in a certain factory, construct a frequency table with classes 40-49, 50-59 and so on. (U)

76	63	83	75	61	41	115	82	60	40	74	42
78	95	56	77	78	65	67	50	84	76	100	53
100	81	59	73	54	79	79	80	104	69	68	79
72	80	70	69	64	42	76	84	90	77	49	66
73	71	94	78	86	51	96	103	52	79	50	72

38. Weights in kg of 50 students of a college are as follows.

42	62	46	54	41	37	54	44	32	45
47	50	58	49	51	42	46	37	42	39
54	39	51	58	47	64	43	48	49	48
49	61	41	40	58	49	59	57	37	34
56	38	45	52	46	40	63	41	51	41

Prepare a frequency distribution table with suitable class intervals. (U)

39. Given below are the daily wages in rupees of 36 workers in a factory manufacturing plastic products.

100	115	120	125	92	140	150	162	189
165	200	220	250	240	300	320	270	280
400	382	288	235	225	312	270	250	242
344	248	188	220	240	212	224	325	425

Form a frequency distribution, taking first class-interval as 90-140 and width as 50. (U)

40. Below are given the marks obtained by a batch of 10 students in Mathematics and Statistics:

Roll No.	1	2	3	4	5	6	7	8	9	10
Marks in Mathematics	53	54	52	52	50	53	54	54	52	50
Marks in Statistics	58	55	57	56	58	57	56	59	57	55

Prepare a bi-variate frequency table. (U)

41. Below are the ages of husbands and wives. Prepare a bi-variate frequency distribution with class intervals as (20-25), (25-30), … for both variables. (U)

Age of Husband (in years)	24	42	29	43	35	41	33	36	29	38
Age of wife (in years)	25	37	25	37	23	39	23	32	24	38

42. Draw a blank table to show the students of a college according to (U)
    i. Class: I PUC, II PUC.
    ii. Faculty: Arts, Commerce and Science.
    iii. Sex: Boys, Girls.

43. Prepare a blank table showing the distribution of students of a college according to : (U)
    i. Faculty: Commerce, Science.
    ii. Sex: Boys and girls.
    iii. Age group (in years): Below 18, 18 - 20, 20 and above.
44. Prepare a blank table to show the distribution of students according to (U)
    i. College: Government, Aided, Unaided.
    ii. Faculty: Science, Commerce, Arts.
    iii. Gender: Boys, Girls.
45. Prepare a blank table showing the particulars relating to the residents of a certain locality according to: (U)
    i. Occupation: office assistants, business men, teachers, bank employees.
    ii. Sex: men and women.
    iii. Marital status: married, single.
46. Draft a blank table to show the distribution of employees of a factory according to- (U)
    i. Sex: Men, Women
    ii. Category: Skilled, Unskilled.
    iii. Wages: Below Rs.5000, Rs.5000-10000 and Rs.10000 & above.
47. In a sample study about the literacy of residents of a village, the following data were observed. 55% of the residents were males; 85% were literates; only 12% were non-literate females. Tabulate the information. (A)
48. In a sample study regarding smoking habit in a town, the following data were obtained:
    Men population = 58%
    Smokers = 22%
    Men smokers = 18%
    Tabulate the above data. (A)
49. In a sample study about food habits of a town, the data was obtained:
    50 % persons were males
    30 % were non-vegetarians
    18 % male non-vegetarians
    Tabulate the above data. (A)
50. The number of students in a college in 2005 was 510. Of these 480 were boys. In 2010 the number of boys increased by 10% and that of girls increased by 30% of that of 2005. In 2012 the total number of students in the college was 1200, the number of boys being double the number of girls. Tabulate the above information. (A)

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Unit-IV

DIAGRAMMATIC AND GRAPHIC PRESENTATION OF DATA

Section – A

One mark questions

1. What is one dimensional diagram? (U)
2. Mention a type of one dimensional diagram. (K)
3. Mention a two dimensional diagram. (K)
4. What is a pie diagram? (U)
5. What is Histogram? (U)
6. Name the graph used to locate mode. (U)
7. Name the graph used to locate median. (U)
8. Mention a merit of a diagram. (K)
9. Mention a merit of graph. (K)
10. Name the average located from Histogram. (K)

Section – B

Two marks questions

11. Mention two needs of diagrams. (U)
12. What are the general rules for drawing a diagram? (K)
13. Name two graphs which located with the help of Histogram (U)
14. Name different graphs used for presentation of frequency distribution. (U)
15. What are less than ogive and more than ogive? (U)
16. Mention the limitations of diagrams and graphs? (K)

Section – C/E

Five marks questions

17. Represent the following data regarding the production of paddy (in '000 tons) by simple bar diagram. (S)

Year	2005	2006	2007	2008
Production	90	85	100	105

18. Following figures represent the decadal change of population of India. Draw a simple bar diagram. (S)

Year	1971	1981	1991	2001	2011
Population(Million)	548	688	846	1028	1210

19. The following table shows the results of II P.U.C. students of a college for the last three years, Draw a multiple bar diagram. (S)

Year	1^{st} class	2^{nd} class	Pass class	Failed
2010	25	32	28	5
2011	28	25	17	10
2012	32	30	15	3

20. The production of wheat and rice of a region are given below: (S)

Year		2005	2006	2007	2008	2009	2010
Production (in Metric tons)	Wheat	12	15	18	19	22	26
	Rice	25	30	32	36	40	45

Draw a multiple bar diagram to represent the data.

21. Following is the data showing the strength of a college in different faculties. Draw a multiple bar diagram to represent the data. (U)

Faculty	Students in the year		
	2008	2009	2010
Arts	150	90	100
Science	120	150	140
commerce	200	250	280
Total	470	490	520

22. Following is the data regarding the strength of students of a university during 2008-10. Construct a component bar diagram. (S)

Year	Faculty				
	Arts	Science	Commerce	Engineering	Medical
2008	200	150	50	30	20
2009	250	200	80	50	40
2010	300	250	100	80	50

23. For the following data regarding the expenditure of families A and B. Represent the data by sub-divided bar diagram. (S)

Items		Food	Clothing	House rent	Education	Fuel	Others
Expenditure in Rupees	Family A	2580	880	2200	360	280	1800
	Family B	3350	1250	3100	1550	450	2000

24. Following data represents the major consumption of food grains in Karnataka state. Represent the data by a subdivided bar diagram. (S)

Food Grains	Quantity Consumed (In million Tons)
Jower	450
Ragi	320
Wheat	150
Rice	400

25. The following data relates to the monthly expenditure (in Rs.) of two families A and B. (S)

Items of expenditure	Expenditure (in Rs)	
	Family A	Family B
Food	2000	2500
Clothing	1000	2000
Rent	800	1000
Light & Fuel	400	500
Miscellaneous	800	2000

Represent the data by a rectangular diagram on percentage basis.

26. Following are the marks obtained by two students A and B in an annual examination. Represent the data by percentage bar diagram. (S)

Subjects	Marks of students	
	Student A	Student B
Language	72	82
English	85	92
Statistics	97	95
Economics	88	90
Business studies	90	87
Accountancy	94	98
Total	526	544

27. Percentage breakup of the cost of construction of a house in Bangalore (Excluding land cost) is given below : Labour: 20% , Bricks:12%, Cement:20%, Steel:15%, Wood:13%, Supervision:15%. Other expenses: 5%. Construct a pie diagram. (U)

28. For the following data regarding the income of the government from different sources, draw a pie diagram: (S)

Source	Customs	Excise	Income tax	Corporate tax	Miscellaneous
Revenue (in Million Rs.)	80	190	160	75	35

29. The following table shows the cost structure of Indian Hotel Industry in percentages. (S)

Cost components	Administrative expense	Employees payments	Repairs and maintenance	Food and Beverages	Electricity	Selling expenses
Total expenses (%)	30	20	12	16	14	8

Draw a Pie diagram to represent the data.

30. Draw a histogram from the following data and locate mode: (S)

C.I	0-10	10-20	20-30	30-40	40-50
f	13	17	15	13	10

31. Draw a histogram for the following data. (U)

Wages (000's Rs.)	2- 4	5 - 7	8 - 10	11 - 13	14 - 16	17 - 19	20 - 22	23 - 25
No. of workers	2	6	8	25	40	30	20	8

32. Draw a histogram for the following data and hence locate the value of mode.

Marks	0-5	5 - 10	10-20	20-30	30-40	40-50	50-70	70-80
No. of students	2	6	8	25	40	30	20	8

33. Draw a histogram and then obtain frequency polygon from histogram. (S)

Daily wages (in Rs.)	100-150	150-200	200-250	250-300	300-350	350-400
No. of workers	7	19	27	15	12	8

34. Draw a frequency polygon to the following frequency distribution. (S)

Mid-points	15	25	35	45	55	65	75
Frequency	5	12	25	18	10	6	2

35. Draw histogram, frequency polygon and then obtain frequency curve from the following frequency distribution. (S)

C.I	10-20	20-30	30-40	40-50	50-60
f	2	5	12	7	4

36. Draw frequency curve from the following frequency distribution. (S)

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	5	14	20	16	8

37. Draw a less than Ogive for the following distribution and locate the median from the graph. (S)

Daily wages Below Rs.	250	260	270	280	290	300	310	320	330	340
No. of workers	6	16	38	70	110	154	192	218	228	250

38. Draw a less than Ogive and locate the median from the graph. (S)

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	3	9	15	30	18	5

39. Draw Ogive from the following data and measure the median value. (S)

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	5	11	21	16	10

40. Draw less than and more than Ogives to the following frequency distribution and hence, locate the value of median. (S)

Classes	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequencies	3	8	14	25	15	7	2

41. Draw less than and more than Ogives to the following frequency distribution. (S)

Class	20-24	24-28	28-32	32-36	36-40	40-44
Frequency	17	25	40	23	12	8

42. From the following data, draw a less than ogive and locate the values of Q_1 and Q_3 Graphically. (S)

Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60
No. of students	5	13	24	39	52	60

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Unit-V

ANALYSIS OF UNIVARIATE DATA

MEASURES OF CENTRAL TENDENCY, MEASURES OF DISPERSION, SKEWNESS AND KURTOSIS

Section – A

One Mark Questions

1. What is meant by 'central tendency'? (K)
2. What is meant by 'measure of central tendency'? (K)
3. Mention any one objective of average. (K)
4. Define arithmetic mean. (U)
5. Define Median. (U)
6. Define Mode. (U)
7. What is uni-modal distribution? (U)
8. Define geometric mean. (K)
9. Define harmonic mean. (K)
10. State the minimal property of mean. (U)
11. What is the value of $\sum(X-\bar{X})$? (K)
12. Find mode for the following data: 3, 4, 5, 5, 6, 8, 5, 7, 5, 5, 8, 5, 5, 4, 5. (A)
13. Calculate mode for the following distribution. (A)

x	10	12	15	22	25	35	45	50	60
f	4	6	10	14	20	18	10	6	3

14. Find the geometric mean of 4, 25. (A)
15. How AM, GM , HM are related? (U)
16. Give the empirical relationship among $\bar{X}$, M , Z. (U)
17. Name an average suitable for qualitative data. (U)
18. What are partition values? (U)
19. Define quartiles. (U)
20. Define deciles. (U)
21. Define percentiles. (U)
22. If median is 50, what is the value of Q_2? (K)
23. What is the relationship between median, Q_2, D_5 and P_{50}? (K)
24. What is dispersion? (K)
25. Define Range. (U)
26. If X: 7, 12, 25, 18, 35 then find range. (U)
27. Define Quartile deviation. (U)
28. Define Mean deviation. (U)
29. Define Standard deviation. (U)
30. What is coefficient of variation? (K)
31. Define variance. (U)
32. If SD = 4 cms, find variance. (A)
33. If variance = 16 Sq. feet, find SD. (A)
34. Define Skewness? (U)
35. What is the relationship among mean, Median and mode for a symmetrical distribution? (K)
36. Define Kurtosis. (U)

37. Name the kurtosis if $\beta_2 > 3$. (K)
38. Name the kurtosis if $\beta_2 = 3$. (K)
39. What is the value of β_2 if the curve is Platykurtic?

Section – B

Two Marks Questions

40. Mention two desired qualities of average. (K)
41. Mention the different measures of average. (K)
42. Which average would be suitable in the following cases? (K)
    a. Average size of ready-made garments.
    b. Average rate of growth of population per decade.
43. Which average would be suitable in the following cases? (K)
    a. Average marks of student in a class.
    b. Average Speed of 4 participants in a 4 x 100 m relay race.
44. State the properties of Arithmetic mean. (U)
45. Mention a merit and demerit of A.M. (K)
46. Mention a merit and demerit of Median. (K)
47. Mention a merit and demerit of Mode. (K)
48. Find the AM of 8, 5, 6, 4, 3, 7, 2. (A)
49. If mean of 50 observations is 70. Find the sum of observations. (A)
50. If sum of 15 observations is 450. Find its mean. (A)
51. Given n_1=50, n_2=100, $\overline{X}_1$= 60, $\overline{X}_2$ = 70, find combined mean. (A)
52. The mean age of the first group of 80 boys is 10years and that of the second group of 20 boys is 15years. Find the AM of the two groups together. (U)
53. Find median for the following data. 17, 32 , 35 , 33 , 15 , 21 , 41 , 32 , 11, 18, 20. (K)
54. Find median for the following data: 5, 9, 8, 6, 1, 4, 10, 8. (A)
55. The arithmetic mean and the median of a slightly skewed distribution are 11cms and 11.7cms respectively. Find the mode of the distribution. (A)
56. In a frequency distribution, if mean = 24.6 and mode = 26.1, find the value of median. (A)
57. In a moderately skewed distribution, the values of mode and median are 20 and 24 respectively. Find the mean. (A)
58. Find GM of 1, 4 and 16. (A)
59. Find the HM of 1,4,16 (A)
60. For the following data compute coefficient of range. (A)
    Height (cms): 160, 158, 159, 165, 148, 139, 142, 155.
61. Mention the different measures of dispersion. (K)
62. What are absolute and relative measures of dispersion? (K)
63. State two merits of S.D. (K)
64. State two demerits of Q.D (K)
65. State two demerits of M.D. (K)
66. If quartile deviation is 7 and Q_1=21. Find Q_3 (A)
67. For a distribution, if the sum of the lower and upper quartiles is 50 and their difference is 10, find the relative measure of quartile deviation. (A)

68. If mean is 20 and SD is 5, find CV. (A)
69. Find mean if CV=10% and SD=4. (A)
70. If coefficient of variation and standard deviation of a distribution are 75% and 15 respectively, find its mean. (A)
71. Mention the two types of moments. (U)
72. Mention two properties of standard deviation. (U)
73. For a moderately skewed distribution, arithmetic mean = 160, mode = 157 and standard deviation = 50, find coefficient of Skewness. (A)

Section – C/E

Five Marks Questions

74. Compute AM for the following data. (A)

x	2	3	4	5	6	7	8	9	10	11
f	3	8	10	12	16	14	10	8	7	5

75. Find mean for the following frequency distribution. (A)

X	19	21	23	25	27	29	31
f	13	15	16	18	16	15	13

76. Find mean for the following frequency distribution. (A)

Marks	10 – 25	25 – 40	40 – 55	55 – 70	70 – 85	85 – 100
No. of students	6	50	44	26	3	1

77. Calculate mean for the following distribution (A)

C.I	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 – 44	45 – 49	50 – 54	55 – 59	60 – 64
f	6	14	12	10	10	9	9	10	6	4

78. Compute mean for the following distribution. (A)

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students	3	8	17	20	22

79. Calculate AM for the following frequency distribution. (A)

Height (Cms)	135 & more	140 & more	145 & more	150 & more	155 & more	160 & more	165 & more	170 & more
No. of students	100	96	87	69	41	17	7	2

80. The mean of the following data is 20.5. Find the missing frequency. (U)

x	10	15	20	25	30
f	5	7	–	12	6

81. Given mean = 30.5 for the following distribution, find the missing frequency. (U)

x	10	20	30	40	50
f	8	10	-	15	7

82. The mean of the following distribution is 50. But frequency with respect to class interval (60 – 80) is missing. Find the missing frequency. (U)

C - I	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
f	19	28	32	–	19

83. For the following distribution if $\bar{x}$ = 45, find the missing frequency. (U)

C.I.	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	5	8	7	-	28	20	10	10

84. In an examination, a candidate scores the following marks (in percentage). Eng (62), Language (74), Mathematics (58), Science (61), Social Science (45). Find the candidates weighted mean if the respective weights are 3, 4, 4, 5 and 2. (A)

85. The AM of 50 observations was 100. At the time of calculations, two values were wrongly taken as 14 and 18 instead of 40 and 80. Find the correct mean. (A)

86. The mean marks of students in 2 sections 'A' and 'B' of a class is 62. The mean mark of students in section 'A' is 70. If the number of students in section 'A' and section 'B' are 30 and 35 respectively, then find the mean marks of students in section 'B'. (U)

87. The average monthly salary of employees of a company was Rs.20,000. The average monthly salaries of male and female employees were Rs.20,800 and Rs.16,800 respectively . Find the percentage of male and female employees of the company. (U)

88. The mean marks of all the students in a class are 72. If the mean marks of boys are 75 and that of girls is 65. Find the proportion of boys and girls in the class. (U)

89. From the following data find median. (U)

Daily wage (Rs.)	120 – 140	140 – 160	160 – 180	180 – 200	200 – 220	220 – 240	240 – 260
No. of employees	8	12	20	30	22	18	10

90. For the following frequency distribution of weight of mangoes, find median. (U)

Weight (gms)	410 – 419	420 – 429	430 – 439	440 – 449	450 – 459	460 – 469	470 – 479
No. of mangoes	10	20	42	54	45	18	7

91. The following table shows the age distribution of persons in a particular region. Find median age. (U)

Age (years)	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	Below 70
No. of persons ('000)	2	7	16	28	30	45	48

92. The median of the following distribution is 24, find the missing frequency. (A)

C I	0-10	10-20	20-30	30-40	40-50
F	5	25	-	18	7

93. Find the mode from the data given below. (U)

X	05	10	15	20	25
F	3	2	8	6	1

94. Calculate mode for the following frequency distribution. (A)

Income (in 000's Rs.)	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6	6 – 7
No. of workers	15	18	30	17	18	12

95. Below is given the frequency distribution of weights of a group of 60 students of a class in a school. Find the modal weight. (A)

Weight(in kg)	30-34	35-39	40-44	45-49	50-54	55-59	60-64
No of students	3	5	12	18	14	6	2

96. Calculate the mode for the following distribution. (U)

C -I	Below10	10-12	12-14	14-16	16-18	18 & above
f	3	15	27	20	3	2

97. From the following distribution of hourly wage (in rupees) of firm employees, find the modal hourly wage. (A)

Hourly wage(Rs.)	<10	<20	<30	<40	<50	<60	<70	< 80
No. of employees	2	15	60	82	95	122	140	150

98. Calculate the geometric mean from the following data. (U)

Diameter (mm)	130	135	140	145	146	148	149
No. of screws	3	4	6	6	3	5	2

99. Calculate GM for the data given below : (U)

C - I	20-30	30-40	40-50	50-60	60-70	70-80
f	7	23	30	22	11	7

100. Calculate the Harmonic mean for the following data (A)

X	12	14	16	18	20
f	3	5	9	4	2

101. Find HM for the following data. (A)

C – I	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
f	10	5	8	7	4

102. In a certain factory, a unit of work is completed by A in 5 minutes, B in 6 minutes, C in 8 minutes, D in 9 minutes and E in 12 minutes. Find the average time to complete the unit of work? (U)

103. A cyclist covers his first two miles at a speed of 5 miles per hour, another two miles at 4 miles per hour and the last two miles at 3 miles per hour. Find the average speed for entire journey. (U)

104. For the values 1 , 4 and 16 show that AM > GM > HM . (U)

105. If X: 4, 4 . Show that AM = GM = HM (U)

106. Calculate lower quartile, upper quartile and 8^{th} decile for the following data.
22, 26, 14, 30, 18, 11, 35, 41, 12, 32. (U)

107. Calculate the first quartile and sixth decile from the following data. (U)

X	58	59	60	61	62	63	64	65	66
f	2	3	6	15	10	5	4	3	2

108. Find the 9^{th} decile and 55^{th} percentile for the following distribution. (A)

C.I.	1-3	3-5	5-7	7-9	9-11	11-13	13-15	15-17
f	6	53	85	56	21	16	4	4

109. Calculate Inter quartile range and semi inter quartile range for the following data
11, 15, 16, 9, 14, 19, 10, 12, 8, 17, 20, 23, 22. (U)

110. Compute coefficient of Q.D. from the data given below. (A)

x	2	4	6	8	10	12
f	3	5	10	12	6	4

111. Calculate semi-inter quartile range and its relative measure for the data given below. (A)

Age (Yrs)	20	30	40	50	60	70	80
No. of Persons	03	61	132	153	140	51	03

112. Calculate Coefficient of Q.D. for the following distribution. (A)

Wages (Rs.)	60-64	64-68	68-72	72-76	76-80	80-84	84-88
No. of workers	12	18	16	14	12	8	8

113. Find semi-inter quartile range for the following distribution . (U)

Age (years)	Less than 25	Less than 30	Less than 35	Less than 40	Less than 45	Less than 50	Less than 55
No. of Employees	10	25	75	130	170	189	200

114. Calculate mean deviation from mean and its Coefficient for the following data.
100, 150, 200, 360, 490, 500, 600. (A)

115. Calculate the mean deviation from mean from the following data. (U)

Variable	10	11	12	13
f	3	12	18	12

116. Find mean deviation from mean for the following distribution. (A)

Height(Inches)	60	61	62	63	64	65	66	67	68
No. of persons	2	1	14	29	25	12	10	4	2

117. Find M.D from mean for the following distribution regarding difference in age (yrs) among couples of a particular community. (A)

Difference(yrs)	0-2	2-4	4-6	6-8	8-10	10-12
No. of couples	220	345	452	280	63	10

118. Calculate the mean deviation from the mean for the following distribution. (A)

C.I.	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12
f	3	5	8	4	2

119. Calculate M.D from median and its relative measure for the following data. (A)
37, 45, 52, 46, 56, 40, 47, 55, 43.

120. Calculate coefficient of M.D from Median for the following frequency distribution. (A)

x	5	6	7	8	9	10
f	8	12	18	8	2	1

121. Calculate coefficient of mean deviation from median for the following distribution. (A)

Age(Yrs)	16	17	18	19	20	21	22	23	24
No. of persons	4	5	7	12	20	13	5	0	4

122. Compute coefficient of M.D from median for the following distribution. (A)

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students	3	8	17	20	25

123. Marks of ten students in a certain test (out of 10) are as follows .compute M.D and its Co-efficient from mode: 7, 4, 10, 9, 15, 12, 7, 9, 7, and 18. (U)

124. Compute M.D from mode for the data given below: (A)

x	0	1	2	3	4	5	6
f	18	22	35	25	20	12	2

125. Compute Mean deviation from mode for the following distribution regarding profit (Rs.) of various firms . (A)

Profit (in '000 Rs.)	20-40	40-60	60-80	80-100	100-120
No. of firms	16	19	41	24	15

126. Find standard deviation of the following data: 25, 50, 45, 30, 70, 42, 36, 48, 34, 60. (A)

127. Find standard deviation of the first five even natural numbers. (A)

128. The mean and standard deviation of a distribution of 100 and 150 items are 50, 5 and 40, 6 respectively. Find the standard deviation of all the 250 items taken together. (U)

129. Calculate standard deviation for the following distribution. (A)

x	8	11	17	20	25	30	35
f	2	3	4	1	5	7	3

130. Calculate variance for the following distribution. (A)

x	4	5	6	7	8	9	10
f	6	12	15	28	29	14	15

131. Find standard deviation and variance from the following data. (A)

C.I.	0-6	6-12	12-18	18-24	24-30	30-36	36-42
f	19	25	36	72	51	43	28

132. Find the combined SD from the following table (A)

	Sample I	Sample II
No. of observations	50	100
Mean	54.1	50.3
S D	8	7

133. The arithmetic mean of marks scored by 3 students A , B & C in a examination are 50 , 44 , 20 respectively . The standard deviations of marks are respectively 15 , 11 and 3 . Who is the most consistent scorer? (U)

Section – D

Ten marks questions

134. Find median and mode for the following distribution. (A)

C - I	200-400	400-600	600-800	800-1000	1000-1200	1200-1400
f	6	9	15	10	7	3

135. Fid standard deviation, variance and coefficient of variation from the following data. (A)

Wage (Rs)	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
No. of persons	12	30	65	107	157	202	222	230

136. The number of runs scored by two batsmen A and B in different innings is as follows : (A)

A	12	115	6	73	7	19	119	36	84	29
B	47	12	76	42	4	51	37	48	13	0

Who is better run scorer? Who is more consistent?

137. Following is the distribution of weights of students. Compare their coefficient of variations. (S)

Weights (Kgs)		20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
No. of Students	Class A	7	10	20	18	7
	Class B	5	9	21	15	6

138. Compute Karl Pearson's coefficient of skewness for the following distribution. (A)

Marks	> 0	> 10	> 20	> 30	> 40	> 50	> 60	> 70	> 80
No. of students	150	140	100	80	80	70	30	14	0

139. Calculate Karl-Pearson' s coefficient of skewness from the following data (A)

C.I.	70-80	60-70	50-60	40-50	30-40	20-30	10-20	0-10
f	11	12	30	35	21	11	6	5

140. Calculate Pearson's coefficient of skewness from the following. (A)

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	10	40	20	0	10	40	16	14

141. Calculate Bowley's coefficient of skewness from the data given below. (A)

C.I.	30-40	40-50	50-60	60-70	70-80	80-90	90-100
f	1	3	11	21	43	32	9

142. Compute the coefficient of skewness based on quartiles. (A)

C.I.	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
f	5	9	14	20	25	15	8	4

143. Calculate Bowley's coefficient of skewness for the following data. (A)

Capital (lakh Rs)	1 – 5	6 – 10	10 – 15	16 – 20	20 – 25	26 – 30	31 – 35
No.of companies	20	27	29	38	48	53	70

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Unit – VI
ANALYSIS OF BIVARIATE DATA
CORRELATION AND REGRESSION
Section – A
One mark questions

1. Define correlation? (U)
2. Give an example for negative correlation between two variables. (K)
3. Give an example for positive correlation between two variables. (K)
4. Give an example where correlation does not exist. (K)
5. What is simple correlation? (U)
6. Give an example for simple correlation. (K)
7. What is multiple correlation? (U)
8. What is causation? (S)
9. What do you mean by spurious correlation? (U)
10. What is 'perfect' correlation? (U)
11. What is the nature of correlation between the variables 'expenditure on advertisement' and ' likely' sales'? (K)
12. What is the nature of correlation between the variables 'number of employees' and 'expenditure on salary'? (K)
13. What is the nature of correlation between the variables 'investment' and ' sales'? (K)
14. What is the nature of correlation between the variables: salary and income tax? (K)
15. Give an example of spurious correlation (K)
16. What is scatter diagram? (K)
17. Mention a merit of scatter diagram. (K)
18. Mention one demerit of scatter diagram. (K)
19. Define Karl Pearson's coefficient of correlation. (K)
20. What is the value of 'r' when two variables are independent? (S)
21. Name the type of correlation when r = -1? (K)
22. If r = 1, what is your conclusion? (S)
23. What is the range for Karl Pearson's coefficient of correlation? (K)
24. Which method is used to calculate correlation coefficient when the data is qualitative in nature? (K)
25. Mention one limitation of Spearman's coefficient of rank correlation. (K)
26. Mention the limits of Spearman's coefficient of rank correlation. (K)
27. If $\sum d^2 = 0$ what is the value of spearman's rank correlation coefficient? (S)
28. What is meant by regression? (K)
29. Write the regression equation of x on y. (K)
30. Write the regression equation of y on x. (K)
31. Write the relationship between correlation coefficient and regression coefficients. (K)
32. What is your conclusion when the regression lines are perpendicular? (S)
33. Write the co-ordinates of the point of intersection of the two regression equation. (K)
34. What is your conclusion when the regression lines coincide? (K)

Section – B

Two marks questions

35. Mention two types of correlation. (K)
36. Mention various methods of computing correlation. (K)
37. Draw a scatter diagram to show positive correlation between two variables. (K)
38. Draw a scatter diagram to show that there exists perfect negative correlation between two variables. (S)
39. Define the term 'correlation'. Give an example. (K)
40. What is 'positive correlation'? Give an example. (K)
41. Mention which type of correlation is associated with
    a) Production and price of vegetable.
    b) Production of pigs and the production of the pig-iron. (S)
42. Mention two uses of the study of correlation. (U)
43. Mention two merits of scatter diagrams. (U)
44. Mention two properties of γ. (K)
45. In a bi-variate data Cov(x,y)=V(x)=V(y).Find r_{xy} and conclude (K)
46. Write the formula for Spearman's coefficient of rank correlation when one rank repeats 'm' times. (S)
47. Mention two merits of Spearman's coefficient of rank correlation. (K)
48. In a bi-variate data on x and y, Var(x) = 9 , Var(y) = 49 and Cov(x , y) = 20. Find r. (A)
49. Given, Cov (X , Y) = -100 , V(x) = 400 and S.D(y) = 5 . Find r. (A)
50. In a bivariate data covariance is 20, variances are 25 and 36 respectively. Find r (A)
51. If $\sum(x-\bar{x})^2 = 6000$, $\sum(y-\bar{y})^2 = 920$ and $\sum(x-\bar{x})(y-\bar{y}) = 240$, Find r. (A)
52. Coefficient of correlation between two variables 'x' and 'y' is 0.32. Their covariance is 10.56. The variance of x is 9. Find Standard deviation of r. (S)
53. If n=9 and $\Sigma d^2 = 24$, find the coefficient of rank correlation. (S)
54. Mention two properties of regression coefficients. (K)
55. Mention two properties of regression lines. (K)
56. Prove that $r = \pm\sqrt{b_{xy}\, b_{yx}}$. (S)
57. Mention two uses of regression analysis. (K)
58. Mention the properties of the regression lines. (K)
59. If r = 0.4, σ_x = 12, σ_y= 15, find the value of b_{xy}. (A)
60. If r = 0.5, σ_x = 10, σ_y= 15, find the value of b_{yx} (A)
61. If bxy =0.5 S.d (x) =4 S.D(Y)=5, find r. (A)
62. If bxy =0.6, r =0.75, S.D(X)= 3 find S.D(Y). (S)

Section – C

Five marks questions

63. Draw a scatter diagram for the data given below and interpret. (S)

x	15	18	20	19	14	12	22	11
y	14	16	13	15	18	18	11	20

64. Draw a scatter diagram for the data given below and interpret. (S)

x	50	100	150	200	250	300	350
y	12	14	13	14	16	18	19

65. Calculate Pearson's coefficient of correlation from the following data. (A)

x	12	9	8	10	11	13	7
y	14	8	6	9	11	12	3

66. Calculate Pearson's coefficient of correlation from the following data. (A)

x	40	42	46	48	50	56
y	10	12	15	23	27	30

67. Calculate Karl Pearson's coefficient of correlation from the following data. (A)

x	36	41	46	59	46	65	31	68	41	70
y	48	60	53	36	50	42	66	44	58	65

68. Calculate the coefficient of correlation by Karl Pearson's method from the following data relating to overhead expenses and cost of production. (A)

Overheads('000Rs)	80	90	100	110	120	130	140	150	160
Cost('000Rs)	15	15	16	19	17	18	16	18	19

69. Following are the marks of 8 students in Statistics and Mathematics. Find coefficient of rank correlation. (A)

Marks in Statistics	25	43	27	35	54	61	37	45
Marks in Mathematics	35	47	20	37	63	54	28	40

70. Following are the ranks given by two Judges regarding exhibits of paintings. Find the Spearman's coefficient of rank correlation. (A)

Paintings	1	2	3	4	5	6
I judge	6	2	1	3	5	4
II Judge	4	1	3	5	6	2

71. Calculate the coefficient of rank correlation from the following data. (A)

x	80	78	75	75	68	67	60	59
y	12	13	14	14	14	16	15	17

72. The following data relate marks in Accountancy and Statistics.

Marks in Accountancy	78	82	78	62	46	52	57	57	58	57
Marks in Statistics	68	81	73	64	52	56	48	68	73	78

Calculate Spearman's coefficient of correlation and interpret its value. (A)

73. Mention two differences between correlation and regression analysis. (K)

74. The following figures relate to years of service and income (in thousands of rupees) of the employees of an organization. Considering the preferential ranks, compute the product moment rank correlation. (A)

Length of service (years)	3	7	9	1	8	6	10	4	5	2
Income (000' of Rs.)	7	5	3	2	6	4	8	10	9	1

75. Find the regression equation of y on x and predict the average value of y when x is 9. (U)

x	3	6	5	4	4	6	7	5
y	3	2	3	5	3	6	6	4

76. From the following data regarding the age of husband and the age of wife, estimate the age of husband when the age of wife is 16 years. (A)

Husband's age (Yrs.)	36	23	27	28	28	29	30	31	33	35
Wife's age (Yrs.)	29	18	20	22	27	21	29	27	29	28

77. You are given with the following information about the expenditure on advertisement and sales : (A)

	Advertisement Expenditure (Crore Rs.)	Sales (Crore Rs.)
Mean	20	120
S.D	5	2

Correlation coefficient = 0.8

I. Obtain the two regression equations.

II. Find the likely sales when the expenditure on advertisement is Rs. 25 crores.

78. Following are the details of the marks scored by students in kannada and English examination. Coefficient of correlation = 0.3

	kannada	English
Mean	40	50
S.D	10	16

Estimate the marks in Kannada when the scores in English is 30. (A)

79. The regression equations of a bi-variate distribution are:
Regression equation of y on x is 4y = 9x+15
Regression equation of x on y is 25x = 6y+7, Find $\bar{x}$, $\bar{y}$ and Y. (A)

80. In a laboratory experiment on correlation research study, the equation to the two regression lines was found to be 2x-y+1=0 and 3x-2y+7=0. Find the means of x and y. Also, workout the values of regression coefficients and the coefficient of correlation between the two variables x and y. (A)

Section – D

Ten marks questions

81. Calculate the coefficient of correlation between the number of male children and the number of female children from the following data . (A)

No. of male children	No. of female children				
	0	1	2	3	4
0	3	4	2	-	-
1	4	8	8	2	-
2	-	7	12	8	4
3	-	3	8	8	5
4	-	-	3	5	6

82. Calculate Karl Pearson's coefficient of correlation. (A)

x \ y	20 – 29	30 – 39	40 – 49	50 – 59
10 – 14	10	10	-	-
14 – 18	-	20	8	-
18 – 22	-	10	25	6
22 – 26	-	-	7	4

83. Calculate Karl Pearson's coefficient of correlation from the data given below : (A)

Marks	Age in years				
	18	19	20	21	22
20 – 25	3	2	-	-	-
15 – 20	-	5	4	-	-
10 – 15	-	-	7	10	-
5 – 10	-	-	-	3	2
0 – 5	-	-	-	3	1

84. Following are the marks of 8 students in Statistics and Mathematics s and. Estimate the marks of a student in statistics who has scored 50 marks in Mathematic and estimate the marks of a student in mathematics who has scored 60 in statistics (A)

Marks in Statistics	25	43	27	35	54	61	37	45
Marks in Mathematics	35	47	20	37	63	54	28	40

85. Find the two regression equations from the following data.

x	3	6	5	4	4	6	7	5
y	3	2	3	5	3	6	6	4

Also find correlation coefficient r_{xy}.

86. Given the following information about expenditure on advertisement (crores) and sales (crores)

	Advertisement expenditure	Sales
Mean	20	120
S.D	5	2

Correlation coefficient = 0.3

(a) Obtain the two regression equations

(b) Estimate the sales when the expenditure on advertisement is Rs.25 crores.

(c) Estimate the budget on advertisement if the sales are Rs. 150 crores.

87. Calculate the two regression co-efficients from the following bi-variate table and determine the value of r. (A)

Y / X	0 – 10	10 – 20	20 – 30	30 – 40
10 – 20	5	4	3	-
20 – 30	7	6	7	6
30 – 40	-	5	-	7

88. Obtain the regression line of x on y for the following bi-variate frequency distribution. (A)

Sales revenue (in '000 Rs)	Advertisement expenditure (in '000 Rs)			
	5 – 15	15 – 25	25 – 35	35 – 45
75 – 125	4	1	-	-
125 – 175	7	6	2	1
175 – 225	1	3	4	2
225 – 275	1	1	3	4

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Unit – VII

ASSOCIATION OF ATTRIBUTES

Section – B

Two marks questions

1. What is meant by association of attribute? Name the different methods of measurement? (K)
2. What is the difference between coefficient of correlation and association of attributes? (U)
3. Write the formula of Yule's coefficient of Association with its range. (K)

Section – C

Five marks questions:

4. Calculate Yule's coefficient of association between marriage and result of students from the following data pertaining to 525 students. (A)

	Pass	Fail
Married	90	65
Unmarried	260	110

5. Eighty eight residents of a city were interviewed during a sample survey and were classified according to smoking and tea drinking habits. Calculate Yule's coefficient of association and comment on its value. (A)

	Smokers	Non-smokers
Tea drinkers	40	33
Non tea drinkers	3	12

6. From the following table find if there is any association between usage of credit card and expenditure, using Yule's coefficient. (A)

	Credit card	No credit card
Expenses	225	50
No Expenses	75	I50

7. Compute Yule's coefficient of Association from the following data.
   (AB) = 150, N = 1000, (A) = 200, (B) = 300. (A)
8. Compute Yule's co-efficient of Association from the following data.
   N = 250, (Aβ) = 70, (A) = 100, (B) = 50. (A)
9. Given, N = 500, (αβ) = 280, (A) = 160 and (B) = 200. Calculate Yule's coefficient of Association. (A)

10. Given, N = 2500, (AB) = 400, (α) = 2100 and (β) = 900. Calculate Yule's coefficient of Association. (A)
11. Prepare a nine square with the following information. Calculate the Yule's Coefficient of Association and interpret the result. (A) = 450, (B) = 600, (Aβ) = 100, N = 1000. (A)
12. Find the association between intelligence of fathers and the intelligence of sons from the following data :
    Intelligent fathers with intelligent sons: 50
    Dull fathers with intelligent sons : 100
    Dull fathers with dull sons : 300
    Intelligent fathers with dull sons : 200 (A)
13. 2000 candidates appeared for a competitive examination. 400 cleared the exam. 350 of them had attended a coaching class, out of which 200 had cleared the exam. Conclude regarding the effectiveness of coaching classes, by using Yule's coefficient of Association(A)
14. 200 candidates appeared for II PUC Examination in a college and 60 of them passed in distinction. 35 had received special coaching in college and out of them 20 Candidates passed in distinction. Using Yule's co-efficient, discuss whether the Special coaching is effective or not. (A)
15. In a collage there are 200 students, out of which 150 are boys. In an examination 120 of the students passed. 10 of the girls failed. Using Yule's coefficient find if there is any association between gender and passing of the examination. (A)

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Unit - VIII

INTERPOLATION AND EXTRAPOLATION

Section – A

One mark questions

1. What is interpolation? (K)
2. What is extrapolation? (K)
3. Write an assumption made in interpolation. (K)
4. Mention one method of interpolation. (K)

Section – C

Five marks questions

5. From the following data interpolate the export of handlooms during 2008. (A)

Year	1998	2000	2002	2004	2006	2008	2010
Export of handlooms (Rs. In crores)	10	13	15	23	26	–	32

6. Interpolate the missing figure from the following table. (A)

Year	2001	2002	2003	2004	2005	2006	2007
Sales ('000 Rs.)	100	120	150	180	210	–	320

7. From the given data interpolate the missing price of a commodity. (A)

Year	2006	2007	2008	2009	2010
Price(Rs)	278	281	–	313	322

8. From the following data interpolate the production of cement in 2007. (A)

Year	2005	2006	2007	2008	2009	2010
Production (lakh tons)	44	90	–	160	270	390

9. Using binomial expansion, ascertain the missing index number from the following data. (A)

Year	2011	2012	2013	2014	2015
Index No.	100	107	?	157	212

10. Extrapolate the sales of a business concern for the year 2015 from the given data. (A)

Year	2010	2011	2012	2013	2014	2015
Sales (000)	13	19	25	38	65	?

11. Following data gives profit of a company for different years. Interpolate the profit for 2014. (A)

Year	2006	2008	2010	2012	2014	2016
Profit (crores)	6	10	12	16	-	24

12. Interpolate the missing value for the year 2005 from the following data. (A)

Year	1995	2000	2005	2010	2015
Value	100	150	?	175	200

13. Extrapolate the value of Y when X = 50 from the below data. (A)

X	10	20	30	40	50
Y	110	90	80	60	?

14. Using binomial expansion method, find the missing value from the following data. (A)

Month	Jan	Feb	Mar	April	May
Value	230	260	350	?	430

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Unit – IX

PROBABILITY THEORY

Section – A

One marks questions

1. Define an outcome. (U)
2. What is a random experiment? (K)
3. Define a Sample space. (U)
4. Write the sample space, when two coins are tossed once (K)
5. Write the sample space, when a die thrown once. (K)
6. What is an event? (K)
7. What is union of events? (K)
8. What is intersection of events? (K)
9. Give the classical (mathematical) definition of probability. (U)
10. Give the statistical (empirical) definition of probability. (U)
11. Give the axiomatic definition of probability. (U)
12. What is the probability of null event? (K)
13. What is the probability of sample space? (K)
14. Define conditional probability. (U)
15. If P(A) =1/4 ,what is P(A')? (S)

Section – B

Two marks questions

16. What is a random experiment? Give an example. (K)
17. Define null event. Give an example. (U)

18. Define simple event. Give an example. (U)
19. Define compound event. Give an example. (U)
20. Define favorable outcomes with an example. (U)
21. Define exhaustive outcomes with an example. (U)
22. Define equally likely events with an example. (U)
23. Define mutually exclusive events with an example. (U)
24. What is complement of an event? Give an example.
25. Show that $0 \le P(A) \le 1$ (K)
26. If A' is the complementary event of A, then show that $P(A) + P(A') = 1$. (S)
27. Define independent events with an example. (U)
28. Define dependent events with an example. (U)
29. A coin is tossed once. Find the probability of getting a head. (S)
30. A coin is tossed once. Find the probability of getting head or tail. (S)
31. A die is thrown once. What is the probability of getting an odd number? (S)
32. When two coins are tossed, find the probability of getting 2 heads. (S)
33. A card is drawn from a pack of cards. what is the probability that it is a king or a Queen card? (S)
34. A card is drawn from a pack of cards .what is the probability that it is a red or black card? (S)
35. If P(A) = 1/13, P(B) =1/4 and $P(A \cap B) = 1/52$ then, find the value of $P(A \cup B)$. (A)
36. If $P(A) = 1/2$, $P(B) = 1/3$ and $P(A \cap B) = 1/6$ then , find $P(A \cup B)$. (A)
37. If $P(A \cap B) = 1/3$ and $P(B) = 2/3$ then , find $P(A|B)$. (A)
38. If $P(A) = 2/3$ and $P(B|A) = 2/5$ then , find $P(A \cap B)$. (A)
39. If A and B are two independent events and $P(A) = 0.6$, $P(B) = 0.5$ then, find $P(A \cup B)$. (A)

Section – C/E

Five marks questions

40. State and prove addition theorem of probability for any two events. (K)
41. State and prove addition theorem of probability for two mutually exclusive events. (K)
42. State and prove multiplication theorem of probability for two dependent events. (K)
43. State and prove multiplication theorem of probability for two independent events. (K)
44. A card is drawn randomly from a pack of 52 playing cards. Find the probability that it is : (i) a King or a Spade (ii) a Spade or a Red. (iii) a spade king. (U)
45. A box contains cards numbered from 1 to 20. A card is drawn randomly from it. Find the probability of getting a card with: (i) an odd number (ii) a multiple of 4 (iii) a perfect square. (S)
46. When three coins are tossed at a time. Find the probability of getting : (i) only heads (ii) at least two heads (S)
47. From a group of 6 boys and 4 girls, two are selected at randomly. What is the Probability that: (a) both are boys (b) both are girls (c) one is boy and other is a girl. (S)
48. A box contains 5 red and 4 green balls. Two balls are drawn at random from this box. Find the probability that they are: (a) 0f Different colours (b) of same colour. (S)
49. A box contains 6 white, 4 black and 5 green balls. Three balls are drawn at random from this box. Find the probability that they are: (a) two white and one black (b) one white and two are green. (S)
50. A box contains 5 red, 4 green and 3 blue marbles. Three marbles are drawn at random from this box. Find the probability that they are of: (i) different colours (ii) the same colour. (S)
51. A bag contains 5 tickets numbered from 1 to 5. Two tickets are drawn at random. What is the probability that the sum of obtained numbers is: (i) odd (ii) even? (U)

52. For a university cricket team 2 players are to be selected from a college having 5 batsmen, 3 bowlers and 2 wicket-keepers. Find the probability of selecting- (i) a batsman and a wicket-keeper (ii) bowlers only. (U)
53. A firm wants to select three candidates among 3 graduates, 5 undergraduates and 8 matriculates. What is the probability of selecting: (a) one graduate and two matriculates, (b) two undergraduates and one matriculate? (S)
54. In a hostel 60% of students drink tea, 50% of students drink coffee and 20% of students drink both tea and coffee. Find the probability that a randomly selected student drinks either tea or coffee. (A)
55. The probability that a contractor will get a plumbing contract is 1/2 and the probability that he will not get an electrical contract is 2/3. If the probability of getting at least one of these contracts is 2/3. What is the probability that he will get both? (A)
56. Probability that A solves a problem is 2/3 and that B solves it is 3/5. If a randomly selected problem is given Find the Probability that: a) both of them solve, b) none of them solves.(S)
57. A, B and C hit a target with probabilities 0.6, 0.5 and 0.4 respectively. If they hit at the target independently, find the probability that: (i) none of them hit the target (ii) the target is hit. (A)
58. A box contains 40 nails and 20 screws. $1/4^{th}$ of nails and 20% of the screws are rusted. If one item is selected at random, what is the probability that it is a rusted nail or a screw? (S)
59. A purse contains 4 silver and 2 gold coins. Another purse contains 3 silver and 4 gold coins. If a coin is selected at random from one of the two purses, what is the probability that it is a silver coin? (S)
60. Contents of the bags are are as follows - I bag: 3 red and 2 green balls, II bag: 4 red and 3 green balls, III bag: 2 red and 2 green balls. One bag is selected at random and then a ball is drawn from it. Find the probability that it is red in colour. (S)
61. Two fair dice are rolled. Find the probability that : (i) both the dice show same numbers, (ii) the sum of numbers is 7 or 11, (iii) the sum is divisible by 3 (iv) product of numbers obtained is 36. (S)
62. What is the probability that there will be 53 Mondays in a randomly selected i) Non-Leap year ii) Leap year? (S)
63. A bag contains 3 white and 5 black marbles. Two marbles are drawn one after another. (i) What is the probability that both are white marbles under with replacement? (ii) both are black marbles under without replacement. (S)

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Unit – X
RANDOM VARIABLE
Section – A
One mark questions

1. Define Random Variable (U)
2. Define Discrete Random Variable (U)
3. Define Continuous Random Variable. (U)
4. What is meant by Probability Distribution ? (K)
5. Define Probability Mass Function (U)
6. Define Mathematical Expectation. (U)
7. Express variance in terms of expectation. (K)
8. Define a Joint Probability Mass Function. (U)
9. What is the value of E(8) if 8is a constant? (A)
10. What is the value of V(4) if 4 is a constant? (A)
11. What is the value of COV(X Y) if X and Y are independent? (K)

12. Express covariance in terms of expectation (K)
13. What is the value of r for two independent random variables? (K)

Section – B
Two marks questions

14. If X is a random variable and a is a constant then prove that E(a)=a (K)
15. If X is a random variable and a is a constant then prove that E(aX) = a E(X) (K)
16. If X ia random variable and b are any two constants, then prove that E(aX+b) = a E(X)+b
17. If X is a random variable and a is a constant then prove that V(a) = 0 (K)
18. If X is a random variable and a is a constant then prove that V(aX) = a^2 V(X) (K)
19. Write the formula for correlation coefficient in terms of expectation. (K)
20. If E(X) = 5 and E(X^2) = 36, find S.D(X). (S)
21. If E(X^2) = 25 and Var (X) = 16, find E(X). (S)
22. If E(X) = 10 and S.D(X) = 12, find E (X^2). (S)
23. If E(X) = 5 ,what is E(6X)? (A)
24. If E(X)= 8 what is E(4X+3)?. (A)
25. If E(X)= 2 what is E(--2X) ? (A)
26. If V(X) = 6 what is V(3X) ? (A)
27. If V(X) = 4 what is V(6X+7) ? (A)
28. If V(X) = 3 , then find Var(-X) (A)
29. V(X) = 9 , then find the values of Var(X/3) (S)
30. If V(X) = 16 , then find the values of Var(3 – X) (S)

Section – C/E
Five marks questions

31. A person tosses a coin thrice. Find the expected number of heads. (S)
32. A random variable X which assumes the values -1, 0 and 1 with respective probabilities 1/4, 1/2 and 1/4. Find the mean and variance. (S)
33. Find the value of k and then find the mean of the following distribution (A)

x	1	2	3	4	5	6
p(x)	0.1	0.15	k	0.25	0.18	0.12

34. A box contains 8 items of which 2 are defective. A man selects 3 items. Find the expected number of defective items in the selection. (S)
35. Given the following probability distribution, find E(X). (A)

x	-2	-1	1	2
p(x)	1/5	2/10	3/10	2/5

36. Calculate E(X+4) for the following probability distribution. (A)

x	10	15	20
p(x)	1/6	2/6	3/6

37. Prove addition theorem of expectation for two discrete random variables X and Y. (K)
38. Prove multiplication theorem of expectation for two independent random variables X and Y. (K)
39. In a bi-variate data E(X)= 4, E(Y) = 10, E(X^2)= 25, E(Y^2) = 136 and E(XY) = 20. Find Karl pearson's correlation. (A)
40. In a bi-variate data E(X) = 6 E(Y) = 9, E(X^2)= 30 , E(Y^2) = 120 and E(XY) = 20. find r_{xy}. Conclude. (A)

41. In a bi-variate data, E(X) = 0 , E(Y) = 12 , $E(X^2)$ = 49, $[E(X)]^2$ = 145 and E(XY) = 3.5
Find Cov(X, Y) and r_{xy}. (A)

42. For the following probability distribution, find E(X), Var(X) , S.D(X) and E(2X-4). (A)

X	-1	0	1	2
p(X)	1/5	1/10	1/13	2/5

43. Find the mean and variance of the following distribution. (A)

X	0	1	2	3	4
p(X)	3/8	1/4	1/8	3/16	1/16

44. From the following probability distribution, find the missing probability, mean and standard deviation of ' X ' (A)

X	-2	-1	0	1	2
p(x)	0.2	0.3	0.2	?	0.1

45. Find the mean, variance and the value of 'k' of the following probability distribution. (A)

X	-3	-2	0	2	3
p(X)	k/6	k/12	2k/3	k/2	k/6

46. A random variable ' X ' assumes the values 10 and 20 with respective probabilities 1/3 and 2/3 Find its mean and variance. (A)

47. A random variable 'X' assumes the values 5 and 10 with probabilities 0.6 and 0.4 respectively. Find E(X), E(2X), V(X). (A)

48. A bag has 4 white and 6 red balls. Two balls are randomly drawn from the bag, find the expected number of white balls. (S)

49. A bag contains 4 green and 3 red balls. A man draws 3 balls at random from the bag. If he is to receive Rs.200 for every green ball he draws and Rs.50 for every red one. What is his expectation? (S)

50. A person throws a biased coin. He gets Rs.80 if head appears otherwise he gets Rs.20. If the probability of occurrence of head is 1/3, find his expected amount. (S)

51. A man throws a fair die. If the throw results in an even number, he gets Rs500 otherwise he loses Rs.100 find his expectation. (S)

52. A man throws a fair die once. If the number obtained is divisible by 3 he gets Rs.900, otherwise he loses Rs250, find his expectation . (S)

53. A person, by paying Rs.50 enters into a game of shooting a target. With one shot, if he hits the target , he gets Rs 1000, otherwise he gets nothing If his probability of hitting the target is 1/7. Find his expected amount. (S)

54. In a lottery, there are 1000 tickets costing Re.1 each. There is one first prize worth Rs.100, two second prizes worth Rs.20 each and ten third prizes worth Rs.10 each. Find the expected loss in buying one ticket. (S)

55. A bag has 3 one-rupee, 4 two rupees and 2 five rupees coins . A boy picks two coins at random from the bag . What is the expectation of the amount 0f the coins? (S)

56. A bag contains 6 tickets numbered 1 to 6. A person draws two tickets at random. If the sum of the numbers on the tickets drawn is even, he gets Rs.100, otherwise he loses Rs.50. What is his expectation? (S)

57. Two fair coins are tossed once. A person receives Rs.10 if both head appears and Rs.5 if both tail appears, otherwise he loses Rs. 8, find the expectation of a person. (S)

58. The probability of a person hitting a target is 2/3. If he hits the target he gets Rs.150, otherwise he loses Rs. 50. Find his expectation. (S)

59. From the following joint probability distribution of X and Y. Find the value of k, E(X+Y) and y_{xy} (A)

X \ Y	1	3	9
2	0.1	0.1	0.05
4	0.2	K	0.1
6	0.1	0.15	0.2

60. For the following joint probability distribution of X and Y, find r and E(3X+4Y) . (A)

Y \ X	1	2	3
-5	0	0.1	0.1
0	0.1	0.2	0.2
5	0.2	0.1	0

61. From the following bivariate data of X and Y find (i) 'k' (ii) E(2X+3Y) (A)

x\ y	0	10	20
1	0	0.1	0.1
2	0.1	0.2	0.1
3	0.2	k	0.1

62. From the following bi-variate data of X and Y find co-efficient of correlation between X and Y (A)

x\ y	0	10	20
1	0	0.1	0.1
2	0.1	0.2	0.1
3	0.2	0.1	0.1

63. For the following data find r_{xy} (A)

x\ y	1	2	3
5	0	0.1	0.1
0	0.1	0.1	0.2
1	0.1	0.2	0.1

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MODEL QUESTION PAPER – 1 (FOR PRACTICE)
STATISTICS-31

Time: 3.15 Hours **Max. Marks: 100**

Note:
1. Graph sheets and statistical tables will be supplied on request.
2. Scientific calculators are allowed.
3. All working steps should be clearly shown.

SECTION-A

I. Answer any TEN of the following questions. **10x1 = 10**

1. Write the Bowley's definition of statistics?
2. Give an example for attribute.
3. Mention an objective of classification.
4. Mention a two dimensional diagram.
5. Define frequency distribution.
6. Give an example for exclusive type of class intervals.
7. Write the empirical formula for Mean, Mode and Median.
8. What is the value of β_1 in a symmetrical distribution?
9. If r =0.5, Name the type of correlation.
10. Product of two regression coefficients is 0.64. What is the value of correlation coefficient?
11. Mention the range of P(A)?
12. If x and y are independent, What is E(xy)?

SECTION-B

II. Answer any TEN of the following questions. **10x2 = 20**

13. Define Sampling. Mention a method of Sampling.
14. Mention the two stages of Statistical Investigation.
15. Obtain class mid points for the following

C.I	0-9	10-19	20-29	30-39

16. Define classification and tabulation.
17. Mention two rules for drawing a diagram.
18. Name the averages located by Histogram and Ogive.
19. Find mode from

x	10	20	30	40	50
y	5	15	25	20	10

20. If $\sum x^2=397$ $\sum x=101$ for 30 observations, find Variance.
21. What is meant by Association of attribute? Mention the range for Yule's coefficient of Association.
22. If r = 0.5, S.D(x) = 4, S.D(y)=5, find $b_{xy.}$
23. If $P(A \cap B)=3/4$, $P(A)=4/5$ find P(B/A)
24. If E(x)=5 find E(2x+4).

SECTION-C

III. Answer any EIGHT of the following questions. **8x5= 40**

25. Mention the functions of Statistics.
26. What is Primary data? Briefly explain two methods of collecting primary data.

27. In a college, there are 300 students out of which 180 are boys and the rest are girls. In a Midterm examination 160 boys passed and 10 girls failed. Tabulate the above data.
28. Following data gives strength of students in two different years in a college opting three different language subjects. Draw multiple bar diagram

Year	Kannada	Sanskrit	Hindi
2010	150	50	20
2011	200	80	40

OR

(For visually challenged students only)

Write down the steps involved in the method of construction of multiple bar diagram

29. If X: 9, 25 Show that A.M>G. M>H.M.
30. Compute Karl Pearson's Coefficient of correlation from the below data.

x	8	4	6	9	10	11
y	9	5	4	8	7	6

31. Compute Regression equation of y on x from the following data.

x	2	4	5	6	8	11
y	18	12	10	8	7	5

32. Following table give the results of BCG Vaccine against Tuberculosis given to infants in a Hospital.

	Not attacked	Attacked
Vaccinated	431	5
Not Vaccinated	291	9

Compute Yule's Coefficients of association and conclude.

33. Interpolate the missing value

Year	2008	2009	2010	2011	2012
Value	4	6	?	8	12

34. State and prove Addition Theorem on probability for any two events.
35. 5 boys and 4 girls of final year B.Com class appear for campus placement. Two students are selected for the job. What is the probability that the selected students are-
(a) Both boys (b) One is a boy and the other is a girl.
36. If E(x)=3, V(x)=5 then find E(5x+2), E(x-2) and V(2x)

SECTION-D

IV. Answer any TWO of the following questions. 2x10= 20

37. From the given table find
    a) Combined S.D
    b) Which class of students is more consistent?
    c)Which class is better marks scorer?

	Class A	Class B
No. of students	100	80
Mean Marks	50	55
S.D of Marks	4	5

38. From the following data calculate Bowley's coefficient of Skewness and conclude.

x	2	4	6	8	10	12
y	11	22	18	15	10	4

39. Compute Karl Pearson's coefficient of correlation from the below table.

C.I	18-20	20-22	22-24	24-26
24-26	1	1	-	-
26-28	3	4	4	2
28-30	-	3	5	6
30-32	-	-	4	4

40. (a) Contents of two boxes are as follows:-
I box: 2 white and 4 black marbles
II box: 3 white and 5 black marbles.
One of the marble is selected from the I bag and transferred to the II bag. Then a marble is selected from the II bag. What is the probability that it is white in colour.

(b) A random variable assumes the values -1, 0 and 1 with probabilities 0.2, 0.7 and 0.1 respectively. Find E(2x).

SECTION-E

V. Answer any TWO of the following questions. **2x5= 10**

41. Following data gives marks of 30 students in a class test marks in Statistics.

12	36	40	30	28
20	19	50	10	10
19	16	27	15	26
19	50	07	33	21
26	37	06	20	11
17	38	30	20	05

Prepare frequency table using 5-10, 10-15 ……as class intervals,

42. Draw less than Ogive to the following data and hence find the number of students who have scored marks less than 70.

Marks	0-20	20-40	40-60	60-80	80-100
No. of Students	5	10	40	25	20

OR

(For visually challenged students only)

Write down the steps involved in the method of construction of ogives

43. Compute Mean deviation and its coefficient from median.
Price of Hand bags: (Rs.) 100, 200, 300, 400, 500

44. A box contains 4 white and 6 brown coloured envelops. A person selects 2 envelops at random. If he receives Rs.300 for every white envelope and Rs. 100 for every brown envelope he selects. Find his expected amount.

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MODEL QUESTION PAPER – 2 (FOR PRACTICE)

STATISTICS-31

Time: 3.15 Hours **Max. Marks: 100**

Note:

1. Graph sheets and statistical tables will be supplied on request.

2. Scientific calculators are allowed..

3. All working steps should be clearly shown.

SECTION-A

I. Answer any TEN of the following questions. **10x1 = 10**

1. Does Statistics deal with individual data?
2. Give an example for discrete variable.
3. Define Inclusive class intervals.
4. Simple bar diagram: Is it one dimensional bar diagram?
5. Name the graph which is used to find mode graphically?
6. If X: 5, 15, 20, 25, 30 what is Median?
7. Difference between largest and smallest value is 10. What is Range?
8. What is the value of β_2 if the curve is platykurtic?
9. $r_{xy} = -1$ Name the type of correlation.
10. Name the points of Intersection of Regression lines.
11. What is P(A) if $P(A^{|})=0.4$?
12. What is V(ax)?

SECTION-B

II. Answer any TEN of the following questions. **10x2 = 20**

13. Define the two types of errors in Sampling.
14. Mention a merit and demerit of sample survey.
15. Find the class width and class Mid points from.

C.I	5-10	10-15	15-20	20-25

16. Define Quantitative Classification. Give an example.
17. Mention two merits of diagrams?
18. If X : 4, 25 find G.M.
19. If $\bar{x}$ = 20 C.V = 40% Find Variance.
20. In a certain data, Mean = 23, Median = 25, S.D=10 find coefficient of skewness.
21. In a bi-variate data Cov(x,y)=V(x)=V(y).Find r_{xy} and conclude.
22. Bring out the difference between correlation and association of attributes.
23. Find the missing probability from

X	0	1	2
P(x)	0.25	?	0.25

24. If $E(x^2)=65$, $E(x)=4$ find S.D(x).

SECTION-C

III. Answer any EIGHT of the following questions. **8x5= 40**

25. Mention five characteristics of Statistics.

26. What is census enumeration? Mention three merits of census enumeration.
27. Draft a blank table to show the distribution of politicians according to
    Sex : Male, Female
    Party : Congress, BJP, JDS
    Designation : MLA, MP
28. Represent the following data by percentage bar diagram.

Subject	Marks scored	
	Student A	Student B
Language	72	82
English	85	92
Economics	88	90
Business Studies	90	87
Accountancy	94	98
Statistics	97	95
Total	526	544

OR

(For visually challenged students only)

Write down the steps involved in the method of construction of percentage bar-diagram.

29. Median of the following distribution is 46. Find the missing frequency.

C.I	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	12	30	34	65	-	25	18

30. Compute Spearman's rank correlation coefficient from the following data.

x	80	78	75	75	68	67	60	59
y	12	13	14	14	14	16	15	17

31. Estimate the value of x when y = 20

	x	y
Mean	25	30
Variance	25	16

Given $r_{xy} = 0.8$

32. Eighty eight Couples residing in a locality were interviewed regarding their Profession and having a Own house. Find Yule's coefficient of Association and conclude.

Profession / House	Own House	Rented House
IT	40	33
Non IT	3	12

33. From the data interpolate the sales for March

Month	Jan	Feb	Mar	Apr	May	Jun
Sales	44	90	-	160	210	290

34. State and prove Multiplication theorem of expectation for two Independent random variables.
35. Three persons Amar, Akbar and Antony hit a target 6, 5 and 4 times out of 10 chances respectively. If each of them aim at a target, What is probability that the
    a) Target is hit (b) Target is not hit

36. A box contains 6 Red, 4 White and 5 Green chalk pieces. A Teacher picks three chalk pieces at random, what is the probability that they are of

a) Same colour (b) Different colours.

SECTION-D

IV. Answer any TWO of the following questions. 2x10= 20

37. Following data gives the marks scored by a girl and a boy in six subjects in a class test. Find who is more consistent in scoring marks.

Girl	25	29	35	39	49	33
Boy	28	23	32	40	49	50

38. (a) In a distribution Mean=65, Mode=80 and coefficient of Skweness = -0.6, find S.D and C.V.

(b) Find Q_2, D_5 and P_{50} from the following data and conclude.

x	10	20	30	40	50
f	5	10	15	12	7

39. Find the two regression equations from the following data.

x	3	6	5	4	4	6	7	5
y	3	2	3	5	3	6	6	4

Also find correlation coefficient r_{xy}.

40. (a) In a college 60% of the students use Simple Calculators, 50% of the students use Scientific Calculators, 20% of the students use both simple and scientific calculators. Find the probability that a randomly selected student uses either simple or scientific calculator.

(b) Find K and Mean from the following table

X	0	1	2	3	4
P(x)	3/8	1/4	K	3/16	1/16

SECTION-E

V. Answer any TWO of the following questions. 2x5= 10

41. Following data gives the number of Lecturers belonging to commerce faculty in 40 different colleges. Prepare a suitable frequency distribution.

8	6	7	5	7	6	3	9	8	6	7	5	7	6	8	5	5	9	5	6
4	7	9	6	6	4	4	7	5	5	8	5	3	3	8	4	3	4	4	3

42. Draw a Histogram to the following frequency distribution.

Marks	<20	<40	<60	<80	<100
No. of Students	10	40	80	100	110

43. Calculate Geometric Mean for

x	5	10	15	20	25
y	3	7	12	8	5

44. Two fair coins are tossed once. A person receives Rs.100, if two head appears and Rs.50, if two tails appears, otherwise he loses Rs.20. Find his Expectation.

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MODEL QUESTION PAPER – 3 (FOR PRACTICE)
STATISTICS-31

Time: 3.15 Hours **Max. Marks: 100**

Note:
1. *Graph sheets and statistical tables will be supplied on request.*
2. *Scientific calculators are allowed.*
3. *All working steps should be clearly shown.*

SECTION-A

I. Answer any TEN of the following questions. **10x1 = 10**

1. Give Croxton and Cowden definition of Statistics.
2. Who is an Investigator?
3. Name the type of classification in the following example.

Year	2010	2012	2014	2016
Profit (Lakhs)	5	10	8	6

4. What are class limits?
5. Mention a use of graph.
6. Mention a merit of A.M.
7. Find mode from x: 10, 5, 12, 5, 16
8. Why is coefficient of variation calculated in dispersion?
9. Yule's coefficient is -1, for two attributes A and B. Comment.
10. Name the type of correlation if two variables vary in the same direction.
11. Define mutually exclusive events.
12. If E(x) = 3 find E(-4x).

SECTION-B

II. Answer any TEN of the following questions. **10x2 = 20**

13. Mention two sources of secondary data.
14. Mention two methods of Sampling.
15. Define continuous variable with an example.
16. Write down two rules of classification.
17. Name the type of cumulative frequency and class limits used in drawing more than Ogive.
18. If n = 10 $\sum 1/x = 8.3$ find H.M
19. Mention any two similarities between mode and median.
20. If x : 5, 10, 15, 20, 25 find coefficient of range.
21. In a moderately skewed distribution mode = 20, median = 24. Find Mean.
22. Mention two properties of Regression co-efficient.
23. Find the missing frequencies from the below contingency table.

C.I	A	α	Total
B	20	-	22
β	-	-	
Total	56	-	100

24. If $E(x^2) = 74$, $E(x) = 5$ find v(x).

SECTION-C

III. Answer any EIGHT of the following questions. **8x5= 40**

25. Mention the limitations of Statistics.
26. What is Questionnaire? Mention any four rules for framing Questionnaire.
27. Prepare a blank table to show the distribution of students according to
    Sex : Male, Female
    Faculty : Arts, Commerce, Science
    Year : 2015, 2016
    Class : I PUC, II PUC
28. Following table relates to the expenditure of a family per month. Draw a Pie Chart.

Items	Food	Rent	Clothing	Fuel	Others	Total
Expenses	1500	3000	900	500	600	6500

OR

(For visually challenged students only)

Write down the steps involved in the method of construction of pie-chart

29. In a Class of 80 students, 60 are girls and the rest are boys. In a test the Mean Marks of the entire class is 50 and Mean marks of girls alone are 55. Find the mean marks of boys in the class.
30. Find Rank correlation coefficient from the below data

Marks	Business Studies	25	43	27	35	54	61	37	45
	Economics	35	47	20	37	63	54	28	40

31. The regression equation of y on x is 3x+5y=3. The regression equation on x on y is 4x+3y=4. Find Mean values of x and y and also the coefficient of correlation.
32. Calculate Yule's coefficient of association and Comment on its value.

	Smokers	Non Smokers
Tea drinkers	40	33
Non Tea drinkers	03	12

33. From the following data, interpolate the missing value.

Year	2010	2011	2012	2013	2014
Value	14	16	?	18	22

34. State and prove addition theorem expectation for two random variables.
35. Probabilities of two students A and B getting a prize in competition are 2/3 and 3/4 respectively. If both of them compete in a competition, find the probability that
    a) At least one of them gets a prize
    b) Both of them do not get a prize
36. From the following probability distribution find Mean and Variance.

X	0	1	2	3
P(x)	0.1	0.4	0.3	0.2

SECTION-D

IV. Answer any TWO of the following questions. 2x10= 20

37. Compute Mean deviation from Median, along with its coefficient to the data given below.

C.I	10-20	20-30	30-40	40-50	50-60
f	5	10	20	15	6

38. Find Karl Pearson's coefficient of skewness from the following data.

x	10	20	30	40	50	60
y	3	10	20	15	10	1

39. Given the following information about expenditure on advertisement (crores) and sales (crores)

	Advertisement expenditure	Sales
Mean	20	120
S.D	5	2

Correlation coefficient = 0.3

(d) Obtain the two regression equations

(e) Estimate the sales when the expenditure on advertisement is Rs.25 crores.

(f) Estimate the budget on advertisement if the sales are Rs. 150 crores.

40. (a) A die is thrown once, what is the probability of getting a

i) Multiple of 2

ii) Multiple of 3

(b) A person enters into a game of shooting a target. If he shoots the target, he gets Rs. 1000 Otherwise he gets nothing if his probability of shooting the target is 1/5. Find the expected amount he gets.

SECTION-E

V. Answer any TWO of the following questions. 2x5= 10

41. From the following data, construct an inclusive frequency distribution with ten as class width.

Marks	45	37	49	54	51	37	15	10	59	27
	65	55	69	63	46	29	18	37	29	45
	33	23	25	18	35	33	42	46	35	47

42. Draw a Histogram to the following data. Hence find Mode.

C.I	10-20	20-30	30-40	40-50	50-60
f	2	5	12	7	4

43. Compute G.M X: 130, 135, 140, 145, 146, 148, 149, 150, and 157.

44. A random variable 'X' assumes the values 10 and 20 with respective probabilities 1/3 and 2/3. Find its Mean and Variance.

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