First PUC Annual Examination, February - 2020

Time : 3-15 Hrs. **Subject - Statistics (31)**

1. Statistical tables and Graph sheets 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. **10 x 1 = 10**

1. Define A. L. Bowley's statement of statistics.
2. Define sampling.
3. Define geographical classification.
4. Define frequency distribution.
5. What is one dimensional diagram?
6. Which average can be obtained from histogram?
7. Find the geometric mean of 1, 2, and 4
8. What are partition values?
9. What is the range of correlation coefficient?
10. What is interpolation?
11. What is the probability of null event?
12. If E (X) = 5, find E (4x)

Section - B

II Answer any TEN of the following questions **10 x 2 = 20**

13. Define discrete and continuous variables.
14. Mention two sources of secondary data.
15. What do you mean by open end class? Give an example.
16. What is tabulation of the data? Mention any one part of table.
17. Distinguish between diagrams and graphs.
18. Mention two types of ogives.
19. The mean and median of a slightly skew distribution are 10 and 10.5 Find mode of the distribution.
20. If Q.D = 17, Q_1 = 22, find Q_3
21. If $b_{xy} = -\frac{3}{4}$ and $b_{yx} = -\frac{1}{3}$ find r_{xy}
22. What is meant by association of attributes? Name a method of measurement of attributes.
23. If $P(A \cup B) = \frac{1}{2}$ and $P(A) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{10}$, find $P(B)$
24. If E (x) = 9 and E (y) = -5, find E (x + y)

Section - C

III Answer any EIGHT of the following questions **8 x 5 = 40**

25. Mention five functions of statistics.
26. Distinguish between census enumeration and sample survey.
27. Draft a blank table to show the population of a town according to
    i) sex : Men, Women
    ii) Religion : Hindu, Muslim, Christian
    iii) Age group (years) : below 20, 20-50, 50 and above
28. To the following data, draw a component bar diagram.

Item	Expenditure in Rupees	
	Family A	Family B
Food	1400	2000
Clothing	1200	1800
Rent	700	1000
Fuel	700	1300
Others	1000	900

(For Visually challenged students only)

Explain the procedure of construction of component bar diagram.

29. Find the harmonic mean for the following distribution.

Weight (Kgs)	40-45	45-50	50-55	55-60	60-65
Number of students	3	10	15	10	2

30. Calculate spearman's rank correlation coefficient from the following data

X	35	37	38	42	44	46	51	54	55	56
Y	40	32	39	42	41	31	50	52	46	55

31. Estimate the value of X when Y = 20, using following data.

	X	Y
Mean	25	30
S. D.	5	4

and r = 0.8

32. Compute Yule's coefficient of association from the following data.
N = 1000, (Aβ) = 100, (A) = 450 and (B) = 600

33. Interpolate the index for the year 2008 from the following data.

Year	2006	2007	2008	2009	2010
Index No.	278	281	·	313	322

34. State and prove addition theorem of probability for two mutually exclusive events.
35. Two cards are drawn from a pack of 52 playing cards. What is the probability that drawn cards are (i) Blacks (ii) Queens.
36. If 'X' is a random variable and 'a' and 'b' are constants, then prove that
(i) E (a x +b) = aE (x) + b (ii) V (ax) = a^2V (x)

Section - D

IV Answer any TWO of the following questions. **2 x 10 = 20**

37. The marks scored by two students A and B are given below. Determine who is more consistent in scoring marks.

A	25	29	35	39	49	33
B	28	23	32	40	49	50

38. Compute Boweley's coefficient of skewness to the data given below and comment

C. I.	25-30	30-35	35-40	40-45	45-50	50-55	55-60
F	2	8	18	27	25	16	7

39. For the following data, calculate Karl Pearson's coefficient of correlation.

X \ Y	0	1	2	3
10	2	4	5	4
12	5	3	6	2
14	3	11	2	3

40. a. A bag has 5 red and 4 blue balls. Another bag has 3 red and 7 blue balls. A ball is drawn from the first bag and is placed in the second. Then a ball is drawn from the second bag. What is the probability that it is red?
b. The probability of a person hitting a target is ½. If he hits the target, he gets Rs. 100, otherwise he loses Rs. 50. Find his expectation.

Section - E

V Answer any TWO of the following questions. **2 x 5 = 10**

41. From the following data construct a continuous frequency distribution with exclusive class intervals of width 10 each.

37,	49,	54,	51,	37,	15,	11,	33,	23,	25
18,	35,	33,	42,	45,	55,	69,	63,	46,	29
18,	37,	46,	59,	29,	35,	27,	45,	47,	65

42. For the following data, draw histogram.

Daily wages (Rs.)	0-10	10-20	20-30	30-40	40-50	50-60
No. of workers	4	10	15	8	3	2

(For visually challenged students only)
Explain the procedure of construction of histogram.

43. An incomplete distribution is given below

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

If the median value is 46, find the missing frequency.

44. From the following probability distribution, find k, E (x) and V (x)

X	-1	0	1	2
P (x)	$\frac{1}{4}$	$\frac{1}{6}$	k	$\frac{5}{24}$