Reg. No.

II Semester Open Elective (NEP-2020) Examination, September 2022
(2021-22 Batch Onwards)
STATISTICS
Business Statistics

Time : 2 Hours   Max. Marks : 60

Instructions :   I) *A single booklet containing **40** pages will be **issued**.*
                      II) ***No** additional sheets will be **issued**.*

PART – A

1. Answer **any ten** of the following :   **(2×10=20)**

   a) State any two properties of Arithmetic mean.

   b) State any two merits and demerits of mode.

   c) Calculate standard deviation of the observations 24, 26, 32, 34, 38, 30, 28, 36.

   d) Find the coefficient of quartile deviation of the series.

       8, 13, 15, 11, 9, 7, 15, 14, 17, 21.

   e) The mean and variance of 20 items are found to be 20 and 6 respectively. Later on, at the time of checking it was found that one item 15 was wrongly taken as 18. Find the corrected mean and variance.

   f) Define Karl Pearson's coefficient of correlation. What are its maximum and minimum values ?

   g) State any two properties of regression coefficients.

   h) For certain X and Y series which are correlated the two regression equations are $5x – 6y + 90 = 0$ and $15x – 8y – 130 = 0$? Find the mean values of X and Y.

i) For a certain set of bivariate data, the following results were obtained :

$\overline{X}$ = 53, $\overline{Y}$ = 28. Regression coefficient of Y on X is – 1.5. Regression coefficient of X on Y is – 0.2. Find the most probable value of Y when X is 60.

j) Define Time series. Give an example of a time series.

k) Mention different components of a time series.

l) State any two uses of index numbers.

PART – B

Answer **any eight** of the following :   **(5×8=40)**

2. For the frequency distribution given below, find :
   a) AM
   b) Median.

Weight in Kilograms	40-44	44-48	48-52	52-56	56-60	60-64	64-68
No. of Students	8	17	31	40	22	10	4

3. A person buys Rs. 1,000 worth of stocks at the rates of Rs. 8, 10, 12 and 20 on four successive trading days. Find the average price per stock.

4. The following table gives the distribution of weekly expenditure per head of the residents of a certain locality. Calculate the standard deviation of the distribution.

Weekly Expenditure (Rs.)	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650
No. of Persons	12	23	35	45	50	40	26	9

5. Calculate the mean deviation from mean from the following frequency distribution.

Height in cms.	140-148	148-156	156-164	164-172	172-180	180-188
No. of students	6	12	19	22	9	2

6. The first of the two samples has 100 items with mean 15 and standard deviation 3. If the whole group has 250 items with mean 15.6 and standard deviation $\sqrt{13.44}$, find the mean and standard deviation of the second group.

7. The following table gives the distribution of number of defective items along with the total number of items produced according to the sizes of the items produced. Find Karl Pearson's coefficient of correlation between size and defect in quality.

Size in inches	15-16	16-17	17-18	18-19	19-20	20-21
No. of items produced	200	270	340	360	400	300
No. of defective items	150	162	170	180	180	105

8. Twelve competitors were judged by two judges in a musical contest. The following are the grades awarded by the judges. Find Spearman's rank correlation coefficient.

Competitors	1	2	3	4	5	6	7	8	9	10	11	12
Grade by judge A	B	A^+	A	C	A	B^+	A	C^+	B	A	B^-	B^-
Grade by judge B	B^+	A	A^-	C^+	B^+	A	A^-	C^+	B	A	C^+	B

9. The following data represents the annual sales and annual cost (both in lakhs of rupees). Estimate the cost when the sales is Rs. 90 lakh.

Cost	39	65	62	90	82	75	25	98	36	78
Sales	47	53	58	86	62	68	60	91	51	84

10. The following data shows the price and quantities of four commodities in the base and current year. Find :

   I) Laspeyre's

   II) Paasche's and

   III) Fisher's price index numbers.

Commodity	Base Year		Current Year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	10	40	12	50
B	12	25	15	20
C	15	60	20	12
D	20	5	30	2

11. Briefly explain the various steps involved in the construction of an index number.

12. Using four yearly moving averages, obtain the trend values for the following data.

Year	Production in tons
2001	68
2002	62
2003	61
2004	63
2005	65
2006	68
2007	63
2008	67
2009	69
2010	70
2011	72
2012	77

13. A company which manufactures steel, recorded the following sales (in tons) in seven years as shown below.

Years	2012	2013	2014	2015	2016	2017	2018
Production	60	72	75	65	80	85	95

Fit a linear equation that describes a linear trend in the production of steel by the company.

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