

## QUESTION 2014

### Group - A

#### (Multiple Choice Type Questions)

1. Answer any ten questions

i) Standard deviation is dependent on

- a) origin only       b) scale only      c) both (a) and (b)      d) none of these

ii) The G.M. of 3, 12 and 48 is

- a) 12      b) 9      c) 6      d) none of these

iii) Correlation coefficient lies between

- a) -1 to +1      b) 0 to 1      c) 1 to 2      d) none of these

- iv) For a distribution A.M. = 105, S.D. = 21. The coefficient of variation is  
 a) 30%                      ✓b) 20%                      c) 19.5%                      d) none of these
- v) The price index of the base year considered as  
 a) 200                      b) 10                      c) 1000                      ✓d) 100
- vi) The median of the following data: 12, 5, 7, 10, 4, 9, 15, 14, 2 is  
 ✓a) 9                      b) 10                      c) 12                      d) 4
- vii)  $Y = a + bX$  in this regression equation,  $b$  is  
 a) intercept                      ✓b) slope                      c) variable                      d) random number
- viii) Which of the following methods will satisfy both time reversal and factor reversal test?  
 a) Lasperye's method                      b) Paasche's method  
 ✓c) Fisher's ideal test                      d) Marshall-Edgeworth method
- ix) A graphical representation of a cumulative frequency distribution is called  
 ✓a) ogive                      b) cumulative frequency polygon  
 c) both (a) and (b)                      d) none of these
- x) Which of the following is the measure of dispersion  
 a) median                      b) mode                      ✓c) mean deviation                      d) none of these
- xi) There are \_\_\_\_\_ models for describing a time series.  
 a) 3                      ✓b) 6                      c) 5                      d) none of these
- xii) Which of the following is false?  
 ✓a)  $A.M. \times H.M. = (G.M.)^2$                       b)  $A.M. \times H.M. = (G.M.)^3 / (G.M.)$   
 c)  $A.M. \times H.M. = (G.M.)^4 / (G.M.)$                       d)  $A.M. \times H.M. = (G.M.) \times (A.M. \times H.M.)$

**Group – B**

**(Short Answer Type Questions)**

2. a) Define primary data and secondary data with examples.  
 b) What is the relation between A.M., G.M. and H.M of  $n$  observations.  
 a) See Topic: **COLLECTION AND PRESENTATION OF DATA**, Short Answer Type Question No. 6.  
 b) See Topic: **MEASURES OF CENTRAL TENDENCY**, Short Answer Type Question No. 11.
3. Following data on the mode of transport, people use to get to their workplace, were obtained from a survey of 100 office-goers in a city:

| Auto | Bus | Train | Taxi | Private Car |
|------|-----|-------|------|-------------|
| 24   | 22  | 25    | 15   | 14          |

Draw an appropriate bar diagram for the above data.

See Topic: FREQUENCY DISTRIBUTION, Short Answer Type Question No. 3.

4. What is the relation between mean, median and mode?

Find mode of the following data:

|                      |           |           |           |           |           |           |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Monthly income (Rs.) | 1000-1500 | 1500-2000 | 2000-2500 | 2500-3000 | 3000-3500 | 3500-4000 |
| No. of Workers       | 30        | 50        | 75        | 68        | 43        | 24        |

See Topic: MEASURES OF CENTRAL TENDENCY, Short Answer Type Question No. 12.

5. Find the missing frequency in the following frequency distribution when the mean is 11.09.

|             |         |          |           |           |           |           |           |           |       |
|-------------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| Class limit | 9.3-9.7 | 9.8-10.2 | 10.3-10.7 | 10.8-11.2 | 11.3-11.7 | 11.8-12.2 | 12.3-12.7 | 12.8-13.2 | Total |
| Frequency   | 2       | 5        | ?         | 7         | 14        | 6         | 3         | 1         | 60    |

See Topic: MEASURES OF CENTRAL TENDENCY, Long Answer Type Question No. 4.

6. If  $X_1, X_2$  and  $X_3$  are uncorrelated variables each having the same standard deviation, obtain the correlation coefficient between  $X_1 + X_2$  and  $X_2 + X_3$ .

See Topic: CORRELATIVE ANALYSIS, Short Answer Type Question No. 1.

Group - C

(Long Answer Type Questions)

7. a) The data below given is the marks secured by 63 candidates in a certain examination:

|    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|
| 21 | 31 | 35 | 52 | 64 | 74 | 89 | 53 | 42 |
| 22 | 35 | 43 | 67 | 76 | 35 | 46 | 26 | 32 |
| 72 | 43 | 38 | 41 | 63 | 71 | 28 | 32 | 45 |
| 15 | 18 | 52 | 73 | 86 | 50 | 39 | 55 | 47 |
| 44 | 58 | 67 | 85 | 39 | 40 | 50 | 65 | 72 |
| 57 | 63 | 5  | 55 | 79 | 37 | 24 | 54 | 82 |
| 51 | 54 | 68 | 29 | 34 | 44 | 58 | 62 | 59 |

Construct a frequency distribution of the marks, take classes of uniform width of 10 marks and 0 as the lower limit of the lower-most class.

b) Construct Fisher's index number from the following data:

| Item | Quantity |      | Price |      |
|------|----------|------|-------|------|
|      | 2009     | 2010 | 2009  | 2010 |
| A    | 10       | 12   | 12    | 15   |
| B    | 5        | 10   | 8     | 10   |
| C    | 12       | 16   | 10    | 12   |

a) See Topic: FREQUENCY DISTRIBUTION, Long Answer Type Question No. 8.

b) See Topic: INDEX NUMBER, Long Answer Type Question No. 12.

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8. a) The coefficient of rank correlation in between a sample of observations is 0.25. If the sum of the squares of differences in ranks is 63, find the total number of observations.

b) Find correlation coefficient for the following data:

|   |   |    |    |   |   |
|---|---|----|----|---|---|
| X | 6 | 2  | 10 | 8 | 4 |
| Y | 9 | 11 | 5  | 7 | 8 |

See Topic: CORRELATIVE ANALYSIS, Long Answer Type Question No. 16.

9. a) The weights (in kg) of 6 persons are 64, 60, 60, 64, 60 and 64. Calculate the mean deviation about mean.

b) Fit a trend equation to the following data by the method of least squares.

|            |      |      |      |      |      |
|------------|------|------|------|------|------|
| Year       | 1975 | 1976 | 1977 | 1978 | 1979 |
| Production | 83   | 92   | 71   | 90   | 169  |

Estimate also the production for 1980.

a) See Topic: MEASURES OF VARIATIONS, Short Answer Type Question No. 5.

b) See Topic: TIME SERIES ANALYSIS, Short Answer Type Question No. 3.

10. a) The following data are given for marks in Statistics and Mathematics recorded at a certain examination.

|            |            |             |
|------------|------------|-------------|
|            | Statistics | Mathematics |
| Mean Marks | 36         | 86          |
| S.D Marks  | 11         | 8           |

Coefficient of correlation between marks is 0.66. Find two regression equations.

b) Find quartile deviation from the following data:

|          |       |       |       |       |       |       |       |
|----------|-------|-------|-------|-------|-------|-------|-------|
| Marks    | 35-36 | 36-37 | 37-38 | 38-39 | 39-40 | 40-41 | 41-42 |
| Students | 14    | 20    | 42    | 54    | 45    | 18    | 7     |

a) See Topic: CORRELATIVE ANALYSIS, Long Answer Type Question No. 17.

b) See Topic: MEASURES OF VARIATIONS, Long Answer Type Question No. 15.

11. a) Calculate the Skewness on the basis of mean, mode and standard deviation.

|    |      |      |      |      |      |      |      |    |
|----|------|------|------|------|------|------|------|----|
| X: | 14.5 | 16.5 | 17.5 | 18.5 | 19.5 | 20.5 | 21.5 |    |
| F: | 35   | 40   | 48   | 100  | 125  | 87   | 43   | 22 |

b) Define time series and state the components of time series.

c) The regression equations are  $8x - 10y + 66 = 0$  and  $40x - 18y = 214$ . Find (i)  $\bar{x}$  and  $\bar{y}$  (ii)  $r$ .

a) See Topic: MOMENTS, SKEWNESS AND KURTOSIS, Long Answer Type Question No. 5.

b) See Topic: MOMENTS, SKEWNESS AND KURTOSIS, Short Answer Type Question No. 1(or).

c) See Topic: CORRELATIVE ANALYSIS, Long Answer Type Question No. 7.