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BCMCMC 108

**Credit Based I Semester B.Com. Degree Examination, Oct./Nov. 2014
(2014-15 Batch Onwards)**

COMMERCE**Business Statistics and Mathematics – I**

Time : 3 Hours

Max. Marks : 80

- Instructions :** 1) Non programmable calculators may be **used**.
2) Logarithm tables are **supplied** on request.
3) Working notes shall be shown **wherever** necessary.

SECTION – A

Answer any four :

(4×4=16)

1. What is an average ? What is the importance of an average ?
2. Write the reasons for popularity of variance.
3. A certain stock grows at the rates of 10%, 15% and 13% in three trading sessions and decreases by 10% and 8% during the next two trading sessions. What is the average growth of the stock in five trading sessions ?
4. Compute a price index for the following by average of price relative method using arithmetic mean.

Commodity :	A	B	C	D	E	F
Price in 2012 (₹) :	20	30	10	25	40	50
Price in 2013 (₹) :	25	30	15	35	45	55

5. If $P = \begin{bmatrix} 9 & 1 \\ 4 & 3 \end{bmatrix}$ and $Q = \begin{bmatrix} 1 & 5 \\ 6 & 13 \end{bmatrix}$, find the matrix R such that $5P + 3Q + 2R$ is a null matrix.
6. Define a symmetric matrix and an unit matrix with an example each.

P.T.O.



SECTION – B

Answer any four :

(4×8=32)

7. Give the meaning of index numbers. What are the steps involved in the construction of index numbers ?
8. For the following data calculate arithmetic mean (by step deviation method) and median.

X:	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
f:	12	30	65	78	90	55	36	25	9

9. Following table gives the marks obtained by a group of students. Calculate variance.

Marks (Below):	14	18	22	26	30	34	38	42	46	50	54	58
Number of students :	2	6	10	18	30	46	56	64	68	74	76	80

10. Calculate Laspeyre's and Paasche's index numbers from the table given below :

Commodity	Price		Expenditure	
	2013	2014	2013	2014
A	8	10	80	120
B	10	12	120	96
C	5	5	40	50
D	4	3	56	60
E	20	25	100	150

11. If matrix $A = \begin{bmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{bmatrix}$, find $A^2 - 5A + 4I$ where I is the unit matrix of order 3.

12. If $A = \begin{bmatrix} 3 & -1 & 3 \\ 1 & 2 & 3 \\ 6 & (x-5) & 6 \end{bmatrix}$, is a singular matrix, find the value of x .



SECTION - C

Answer any two :

(2×16=32)

13. Calculate geometric mean and harmonic mean for the following data :

Marks (less than) : 10 20 30 40 50 60 70

No. of students : 5 12 27 52 60 66 70

14. You are given below the daily wages paid to the workers in two factories X and Y :

Daily wages (Rs.)	No. of workers	
	Factory X	Factory Y
120-130	15	25
130-140	30	40
140-150	44	65
150-160	60	35
160-170	30	14
170-180	14	15
180-190	7	6

Using appropriate measures answer the following :

a) Which factory pays higher average wage ?

b) Which factory has a more consistent wage structure ?

15. Using Cramer's rule solve the following equations :

$$4y - 4x - 5z = -22$$

$$3z + 4x = 6y + 2$$

$$z - 3y = 14 - 10x$$

16. Solve the following equations by matrix method :

$$2x + 4y = z + 9$$

$$y + 2z = -3x + 7$$

$$-3z + x - 4 = -3y$$