

C 81790

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Name.....12.....

Reg. No.....

**FOURTH SEMESTER B.Com./B.B.A. DEGREE EXAMINATION
APRIL/MAY 2015**

(U.G.—CCSS)

Common Course

A 13—BASIC NUMERICAL SKILLS

Time : Three Hours

Maximum : 30 Weightage

Part A

I. Objective Type Questions. Answer all *twelve* questions :

Choose the correct answer :

1 The equation $3x + 5 = 0$ has :

- (a) No solution. (b) One solution.
(c) Three solutions. (d) Infinitely many solutions.

2 Which of the following statements about sets is wrong ?

- (a) $A \cap B = B \cap A$. (b) $A \cup B = B \cup A$.
(c) $A \cup (B \cap C) = A \cap (B \cup C)$. (d) $A \cap (B \cap C) = (A \cap B) \cap C$.

3 Which of the following gives the correct relationship between the arithmetic mean (A.M.), geometric mean (G.M.), and harmonic mean (H.M.) ?

- (a) $A.M. \leq H.M. \leq G.M.$ (b) $H.M. \leq A.M. \leq G.M.$
(c) $G.M. \leq A.M. \leq H.M.$ (d) $H.M. \leq G.M. \leq H.M.$

4 Which of the following is not a measure of variation ?

- (a) Range. (b) Standard deviation.
(c) Mean deviation. (d) Skewness.

Fill in the blanks :

5 If A and B are two sets and $A \subset B$, then $A \cup B =$ _____.

6 The common difference of the A.P. $-10, -7, -4, \dots$ is _____.

7 The empirical relationship between Mean, Median and Mode is _____.

8 A quadratic equation has _____ roots.

Turn over

Answer the following :

- 9 Give *one* limitation of the arithmetic mean.
- 10 Write any *three* measures of central tendency.
- 11 Define the complement of a set.
- 12 State whether the following statement is True or False :

The point $(-2, 3)$ lies on the line $2x + 3y = 0$.

($12 \times \frac{1}{4} = 3$ weight)

Part B

II. Short Answer questions. Answer all *nine* questions :

- 13 If the arithmetic mean and geometric mean of two values are 10 and 8 respectively. Find values.
- 14 Using Venn diagrams represent :
 - (a) $A \cap B$.
 - (b) $A \cup B$.

15 Find the inverse of the matrix $\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$.

16 Find the quadratic equation whose roots are -3 and 5 .

17 Solve the system of equations

$$x + y = 6$$

$$3x + y = 8.$$

18 Define median and mode of a set of numbers.

19 Find the 100th term of the arithmetic progression 1, 5, 9,

20 A bank pays simple interest @ 6 % per annum. What will be the maturity amount of a sum of Rs. 10,000 after two years ?

21 Write the quadratic equation formula for solving $ax^2 + bx + c = 0$.

($9 \times 1 = 9$ weight)

Part C

III. Short Essay or Paragraph questions. Answer any *five* questions from seven :

22 Let $A = \begin{bmatrix} 1 & -1 \\ 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 1 \\ 0 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 4 \\ -1 & 3 \end{bmatrix}$.

Show that $A(B + C) = AB + AC$.

23 The sum of three numbers in A.P. is 42 and their product is 2618. Find the numbers.

24 The n^{th} term of the G.P. $\frac{1}{9}, \frac{1}{3}, 1, \dots$ is 243. Find n .

25 Draw a histogram and frequency polygon for the following data :

Weekly wages (in Rs.)	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
No. of Workers	14	28	36	12	10

26 Solve $\frac{2}{x} + \frac{x}{2} = 2$.

27 Calculate the trend values by the method of least squares from the data given below and estimate the sales for the year 2001.

Year	1992	1993	1994	1995	1996
Sales of T.V. (in '000)	12	18	20	23	27

28 The mean and standard deviation of a set of 100 observations were worked out as 40 and 5 respectively. But by mistake a value 50 was taken in place of 40 for one observation. Recalculate the correct mean and standard deviation.

(5 × 2 = 10 weightage)

Part D

IV. Essay Questions : Answer any *two* questions from *three*.

29 The table below gives the weight measurements of 200 castings :

Weight in kg.	No. of Castings	Weight in kg.	No. of Castings
81 - 90	2	141 - 150	37
91 - 100	5	151 - 160	29
101 - 110	13	161 - 170	11
111 - 120	20	171 - 180	3
121 - 130	30	181 - 190	1
131 - 140	49		

Calculate the arithmetic mean, median, mode and standard deviation.

Turn over

30 Solve the system of equations using matrices :

$$2x + 3y - z = 9$$

$$x + y + z = 9$$

$$3x - y - z = -1.$$

31 From the following data construct an index for 2009 taking 2008 as base by the average relatives method using :

(a) Arithmetic mean ; and

(b) Geometric mean for averaged relatives

Commodity	Price in 2008 (Rs.)	Price in 2009 (Rs.)
A	50	70
B	40	60
C	80	90
D	110	120
E	20	20

(2 × 4 = 8 weightage)