

Roll No. ....

## BBA-201(O)

B. B. A. (Second Semester)  
EXAMINATION, May, 2013

(Old Course)

Paper First

### BUSINESS MATHEMATICS

Time : Three Hours ]

[ Maximum Marks : 75

Note : All questions are compulsory and carry equal marks.

1. (a) If :

$$X = \begin{bmatrix} 1 & 3 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}, Y = \begin{bmatrix} -3 & -2 \\ -1 & -5 \\ -4 & 3 \end{bmatrix}$$

find Z such that  $X + Y - Z = 0$ .

(b) If :

$$A = \begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$$

and  $C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 1 \end{bmatrix}$ , prove that  $(AB)C = A(BC)$ .

Or

Find all the co-factors of the elements of first row in the following determinant :

$$\begin{vmatrix} -2 & 3 & 4 \\ 1 & -2 & 3 \\ -5 & 3 & -4 \end{vmatrix}$$

2. (a) The depreciation rate of a machine is 10% per annum. If after 4 years the value of the machine is ₹ 1,31,220, find the cost of the machine.

- (b) A person saves  $\frac{3}{5}$ th of what he spends from his income. Find out how much he saves from his income.

Or

In an urn, there are coins of ₹ 1, 50 paise and 25 paise in the ratio of 5 : 6 : 7. If their total value is ₹ 117, find how many coins are there of each type.

3. If Ram earns 3% on  $\frac{1}{4}$ th of his capital, 5% on  $\frac{2}{3}$ rd of his capital and 11% on the remaining capital, how much percentage of yield does he get on his total capital ?

Or

Find the sum upto  $n$  terms :

(a)  $3 + 33 + 333 + \dots$

(b)  $0.7 + 0.77 + 0.777 + \dots$

4. (a) If  $A = \{11, 12, 13, 14, 15, 16\}$  and  $B = \{11, 12, 15, 16, 17, 18, 19\}$ , then find  $A \cup B$ ,  $A \cap B$ ,  $A - B$  and  $B - A$ .
- (b) If  $A = \{1, 2, 3\}$ ,  $B = \{2, 4, 6, 8\}$  and  $C = \{3, 4, 5, 6\}$ , then find  $A - (B - C)$ .

Or

If  $U = \{1, 2, 3, 4, 5, \dots, 24\}$ ,  $A = \{2, 6, 8, 14, 22\}$ ,  $B = \{4, 8, 10, 14\}$ , verify that  $(A \cap B)' = A' \cup B'$ . Also represent it using a Venn diagram.

5. Find the points of maxima and minima of  $f(x) = (x - 1)(x + 2)^2$ . Find also the maximum and minimum value of  $f(x)$ .

Or

Integrate w. r. to  $x$  :

(a)  $\frac{(1+x)^2}{x^2}$

(b)  $\frac{x^3 + 5x - 6}{x^2}$