Roll No. .....

57002

BBA Ist Semester (Old) 2011-14

Examination–November, 2014

Business Mathematics

Paper-BBA-102

Time : 3 hours ***Max. Marks : 80***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt **five** questions in all. Q. No. 1 (Section A) is **compulsory**. From Section B, attempt **four** questions (**one** question from each unit). All questions carry equal marks.

SECTION A

1. (a) List the subsets of the set $\{a, b, c\}$.

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(b) Taking a hypothetical example, show the difference between $(A \cap B)$ and $(A - B)$.

(c) If $\log_a b = 10$, then what is the value of $\log_b a$?

(d) Find the 8th term of the series 8, 11, 14, ...

(e) If ${}^5P_r = 60$, find ${}^5C_r$.

(f) Find the co-efficient of x^6 in $(x + 2)^9$.

(g) If $\frac{dy}{dx} = (3x^2 + 4)^4 . 6x$ then find the value of y.

(h) Differentiate between diagonal matrix and scalar matrix.

SECTION B

Unit I

2. (a) List the following sets:

(i) $\{x \mid x \in N \text{ and } x \leq 10\}$;

(ii) $\{x \mid x \in Z \text{ and } x < 6\}$

where N denotes the set of natural numbers and Z denotes the set of integers.

(b) Find all possible solutions of x and y in:

(i) $\{2x, y\} = \{4, 6\}$ and

(ii) $\{x, 2y\} = \{1, 2\}$

(c) A is a set {1, 3, 5, 7, 9, 11, 13, 15, 17, 19}, list the following:

(i) $\{x \mid x$ is an element of A and $2x \leq 20\}$

(ii) $\{x \mid x$ is not an element of A and $0 < x < 15\}$

3. In a survey of 100 families, the number of families that read recent issues of a monthly magazine were found to be: September only –18; September but not August–23; September and July–8; September–26; July –48; July and August–8 and none of the three months–24.

Find how many families read the:

(a) August issue;

(b) Two consecutive issues;

(c) July issue, if they did not read the August issue; and

(d) September and August issues but not the July issue.

Unit II

4. (a) Find the value of

$$\frac{(0.3)^{1/3}.\left(\frac{1}{27}\right)^{1/4}.(9)^{1/6}.(0.81)^{2/3}}{(0.9)^{2/3}.(3)^{-1/2}.\left(\frac{1}{3}\right)^{-2}.(243)^{-1/4}}$$

(b) Using log tables, find the value of

$$\frac{(6.284)^3 . \sqrt[3]{624}}{\sqrt[4]{0.005}}$$

5. (a) Sum of three numbers, in A.P. is 15 and the sum of squares of first and third numbers is 58. Find the numbers.

(b) Sum of three numbers in G.P. is 35 and their product is 1000. Find the numbers.

Unit III

6. (a) Out of the letters A, B, C, *p*, *q*, *r*, how many words can be made

(i) beginning with a capital letter

(ii) beginning with a small letter and ending with a capital letter.

(b) A question paper contains 6 questions, each having an alternative. In how many ways can an examinee answer one or more questions?

7. Second, third and fourth terms in the expansion of $(x + a)^n$ are 240, 720 and 1080 respectively. Find x, a and n.

8. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$,

show that $A^2 - 4A + 3I_2 = O$.

9. A product can be manufactured at a total cost:

$$C(x) = \text{Rs.} \left[\frac{x^2}{100} + 100x + 40 \right]$$

where x is the number of units produced.

The price at which each unit can be sold is

$$p = \text{Rs.}\left[200 - \frac{x}{400}\right].$$

Determine the production level at which the profit is maximum. Also find the price per unit and the total profit at this level of production.
