BBA–102(N)

B. B. A. (First Semester)
EXAMINATION, Dec., 2013

(New Course)

Paper Second

BUSINESS MATHEMATICS

Time : Three Hours]   [*Maximum Marks : 70*

Note : Attempt any *ten* questions from Section A and any *two* questions from Section B.

Section—A   5 each

1. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -1 & 7 \end{bmatrix}$, find $3A^2 - 2B$.

2. Find the rank of the matrix A, where :

$$A = \begin{bmatrix} 1 & 3 & 4 & 3 \\ 3 & 9 & 12 & 3 \\ 1 & 3 & 4 & 1 \end{bmatrix}$$

3. The ratio of present age of A and B is 3 : 4. The ratio of age 5 years back was 5 : 7. Find their present ages.

4. If the population of a city is 250000 in beginning the year 2005, find what will be the population at the end of 2007, if the growth rate is 5% p. a.

5. Find the sum of all the odd numbers between 100 and 300.

6. The sum of a G. P. is 315 and the first term and common ratio are 5 and 2 respectively. Find the last term and number of terms.

7. Find the compound interest on ₹ 15,000 for 3 years @ 5% p. a.

8. In what time will ₹ 875 amount to ₹ 888·425 at $3\frac{1}{2}$% p. a. ?

9. If $A = \{a, b, c, d\}$; $B = \{b, d, e, f\}$ and $C = \{e, d, g, b\}$ write $A \cup B$, $B \cap C$ and $A - B$.

10. Differentiate the following function with respect to x :

(a) $\dfrac{9x}{x^4 + 5}$

(b) $\dfrac{4x^2}{(8 + x^3)}$

11. Find the following integrals :

(a) $\int x^4 \cdot (5x^5 + 3x^2 - 9)\,dx$

(b) $\int \dfrac{(2x+5)^2}{\sqrt{x}} \cdot dx$

12. If $^np_r = 240$, $^nC_r = 120$, find 'n' and 'r'.

13. A bag contains 4 black and 5 red balls. 6 balls are drawn at random. Determine the number of ways in which 3 black and 3 red balls can be drawn.

Section—B　　　　10 each

14. If matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$

find inverse matrix of A.

15. Find the maximum and minimum values of the function :

$$f(x) = x^3 - 2x^2 + x + 6$$

16. Prove that :

$$(A \cap B)' = A' \cup B'$$

where $A = \{2, 3, 4, 5, 6\}$, $B = \{3, 6, 7, 8\}$ are subsets of $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$.