Roll No. .....

BBA–102(N)

B. B. A. (First Semester) EXAMINATION, Nov./Dec., 2018

(New Course)

Paper Second

BUSINESS MATHEMATICS

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

Note : Attempt questions from all Sections as directed.

Inst. : The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

Section—A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries 3 marks.

1. (A) Give definition of Matrix. Explain the procedure of the multiplication of matrices.

(B) If $A = \begin{bmatrix} 1 & 2 \\ 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 2 \\ -1 & 3 \end{bmatrix}$, find $A^2 - B^2$.

(C) Find the rank of the matrix A, where :

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 2 & 2 \end{bmatrix}$$

(D) If $A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$ find $3A^2 + 5I$.

(E) How much should a man reduce the use of milk whose price has increased by 25%, so that he may have to spend no extra money ?

(F) In an arithmetic progression, the sum of n terms, common difference and last turn are 136, 4 and 31 respectively. Find the value of n.

(G) State and prove De-Morgan's theorem.

(H) Three men have 6 shirts, 4 coats and 5 caps. In how many ways can they wear them ?

(I) Find $\frac{dy}{dx}$:

(i) $x^2 + 2xy + y^4 = 4$

(ii) $y = (1 + x^2)^7$

(J) Integrate w. r. t. x :

$(2x^2 + 1)^2 . 4x$

Section—B

(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 10 marks.

2. Let $A = \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} a & b \\ 3 & 5 \end{bmatrix}$ be two matrices. Find the value of a and b such that A. B = B. A.

3. Using Clause elimination method, solve the following system of equations :

$$2x + 3y + 3z = 5$$
$$x + 2y + z = -4$$
$$3x - y - 2z = 3$$

4. The ratio of annual incomes, expenditures and savings of Sonu and Monu are 5 : 3, 8 : 5 and 2 : 1 respectively. If the joint savings of both is ₹ 3,600 in a year, find their annual income.

5. (a) How many terms are there in G. P. Series 1 + 4 + 16 + 64 + ... whose sum is 5461 ?

(b) Find the sum of G. P. series 1 + 3 + 9 + ... + 2187.

Section—C

(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 10 marks.

6. (a) The compound interest of a certain sum of money is ₹ 2,522 for 3 years at the rate of 5% p.a., find the sum of money.

(b) In what time a sum of money will double itself at a rate of simple interest of 4% per annum.

7. In a group of 52 persons, 16 drink tea but not coffee and 33 drink tea.

(i) How many drink tea and coffee both ?

(ii) How many drink, coffee but not tea ?

8. Find the differential coefficient of the following functions with respect to x :

(i) $\sqrt{a + 2a^2e^x + a^3e^{2x}}$

(ii) $\left(2 + \frac{3}{x} + \frac{4}{x^2} + \frac{6}{x^3}\right)$

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

$$x^3 - 2x^2 + x + 6$$

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