Roll No. …………………..

BBA–102

Business Mathematics (व्यावसायिक गणित)

Bachelor of Business Administration
(BBA–10/12/16/17)

First Semester, Examination, 2018

Time : 3 Hours   Max. Marks : 80

Note : This paper is of **eighty (80)** marks containing **three (03)** Sections A, B and C. Attempt the questions contained in these Sections according to the detailed instructions given therein.

Section–A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.

1. Find the sum of the series :

$$1 + \frac{2}{5} + \frac{3}{5^2} + \text{........ upto } n \text{ terms.}$$

2. Find the inverse of the matrix :

$$\begin{pmatrix} 1 & 2 & -1 \\ -4 & -7 & 4 \\ -4 & -9 & 5 \end{pmatrix}$$

3. (i) If $A = \begin{pmatrix} 0 & 1 & 2 \\ 2 & 3 & 4 \\ 4 & 5 & 6 \end{pmatrix}$ and $K_1 = i$, $K_2 = 2$, verify

$$(K_1 + K_2)A = K_1A + K_2A.$$

(ii) If $A = \begin{pmatrix} 0 & 2 & 3 \\ 2 & 1 & 4 \end{pmatrix}$, $B = \begin{pmatrix} 7 & 6 & 3 \\ 1 & 4 & 5 \end{pmatrix}$, find the value of $2A + 3B$.

4. From the following equation find the value of x and y :

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

Section–B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short answer type questions of eight (8) marks each. Learners are required to answer *four* (04) questions only.

1. Find the sum of $\dfrac{3}{4}, \dfrac{2}{3}, \dfrac{7}{12}, \ldots$ upto 19 terms.

2. If $x = 3^{\frac{2}{3}} + 3^{-\frac{2}{3}}$, show that :

$$9x^3 - 27x = 82$$

3. Let A, B, C be three sets, then :

$$A \times (B \cup C) = (A \times B) \cup (A \times C)$$

4. Simplify :

$$\dfrac{x^{m+2n} \cdot x^{3m-8n}}{x^{5m-6n}}$$

5. Which terms of the A. P. :

    49, 44, 39, ... is 9 ?

6. Insert two harmonic means between $\dfrac{1}{2}$ and $\dfrac{4}{17}$.

7. If $H_1, H_2, ..., H_n$ are n harmonic means between two given numbers, then show that :

    $$H_1 H_2 + H_2 H_3 + ... + H_{n-1} H_n = (n-1) H_1 H_n$$

8. Expand $(x-1)^7$.

Section–C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this Section are compulsory.

Write True/False against the following :

1. If $\dfrac{dx}{dy} g(x) = F(x)$, then $F(x)\, dx = g(x) + C$. (True/False)

2. If $y = x^2 \sin x$, then $\dfrac{dy}{dx} = 2x \sin x \, x^2 \cos x$.

    (True/False)

3. If $a = b^c, b = c^a$ and $c = a^b$, then $abc = 2$.

    (True/False)

4. Sale = Variable Cost + Fixed Cost + Profit/Loss.

    (True/False)

5. If $y = x^3 + \tan x$, then $\dfrac{d^2 y}{dx^2} = 2 \sec^2 x \tan x$.

    (True/False)

6. A matrix which has exactly one column is called a column matrix. (True/False)

7. A matrix which has exactly one row is called a square matrix. (True/False)

8. The main value of $\sin^{-1}\left(\dfrac{1}{\sqrt{2}}\right) = \dfrac{\pi}{4}$. (True/False)

9. If $y = \text{A} \sin x + \text{B} \cos x$, then $\dfrac{d^2 y}{dx^2} + y = 0$.

(True/False)

10. $\log_b pq = \log_b p + \log_b q$. (True/False)