BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Com.(AFB)-Hons]-2024
Course Name – Business Mathematics
Course Code - BBF10001
(Semester I)

Full Marks : 60   **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)   1 x 15=15

1. Choose the correct alternative from the following :

(i) A box has 210 coins of denominations one-rupee and fifty paise only. The ratio of their respective values is 13:11. Then identify the number of one-rupee coin is

a) 65   b) 66
c) 77   d) 78

(ii) In a school having roll strength 286, the ratio of boys and girls is 8:5. If 22 more girls get admitted into the school, then recognize the ratio of boys and girls.

a) 12:7   b) 10:7
c) 8:7   d) 4:3

(iii) In an arithmetic progression, the first term is 10, and the common difference is 5. Identify the 6th term in this sequence

a) 30   b) 25
c) 35   d) None

(iv) Identify the sum of the geometric series: 3 6 12 ... 96 if the common ratio is 2.

a) 265   b) 189
c) 300   d) 100

(v) If 2/3 of A= 75% of B=0.6 0f C, then identify the value of A:B:C.

a) 2:3:3   b) 3:4:5
c) 4:5:6   d) 9:8:10

(vi) Identify the greatest ratio $\frac{7}{3}, \frac{25}{7}, \frac{35}{9}, \frac{19}{2}$

a) $\frac{7}{3}$ b) $\frac{25}{7}$

c) $\frac{19}{2}$ d) $\frac{35}{9}$

(vii) A loan of Rs.10,000 is to be repaid in 30 equal annual instalments of Rs. P. Interpret P if the compound interest charged is at the rate of 4% p.a. Given $(1.04)^{30} = 3.2434$

a) Rs.178.30   b) Rs. 578.30
c) Rs. 190.78   d) None of these

(viii) Identify the solution of the equation: $2x + 1 = 15$

a) $x = 2$ b) $x = 7$
c) $x = 4$ d) $x = 5$

(ix) Examine the correct number of elements in the Power set P(S) of the set

$S = \{\phi, \{\phi\}, \{\phi, \{\phi\}\}\}$

a) 2   b) 4
c) 8   d) None of these

(x)

$$\begin{bmatrix} 1 & 0 & 0 \\ 5 & 1 & 0 \\ 3 & 2 & 4 \end{bmatrix}$$

Judge the nature of the transpose of the matrix

a) a diagonal   b) an upper triangular
c) a lower triangular d) a symmetric matrix

(xi) If A and B are square matrices and A^{-1} and B^{-1} exist then calculate $(AB)^{-1}=$

a) $A^{-1}B^{-1}$ b) AB^{-1}
c) $B^{-1}A^{-1}$ d) $A^{-1}B$

(xii) Calculate trace of the matrix is $\begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix}$

a) 0   b) 3
c) 1   d) 6

(xiii) A is a square matrix, if it is Symmetric then, Choose the correct one.

a) $A^T = O$ b) $A^T = -A$
c) $A^T = A$ d) $A^T - A = 2A$

(xiv) Choose the correct option: $\int \sin 3x dx = k\cos 3x$ then k is equal to,

a) 3   b) $\dfrac{1}{3}$

c) $-\dfrac{1}{3}$ d) none

(xv) Choose the value of $\int \dfrac{dx}{x\log x} =$

a) logx+c   b) log(logx)+c
c) $e^x + c$ d) None of these.

Group-B
(Short Answer Type Questions)   3 x 5=15

2. A person borrowed Rs.8,000 at a certain rate of interest for 2 years and then Rs.10,000 at 1%   (3)
lower than the first. In all he paid Rs.2500 as interest in 3 years. examine the two rates, he

borrowed the amount.

3. Identify the solution of the quadratic equation: $2x^2 - 5x + 2 = 0$ (3)

4. Illustrate $\int \frac{e^x}{e^x+1}\, dx$. (3)

5. In a group of 60 people, 27 like cold drinks and 42 like hot drinks and each person likes (3)
   at least one of the two drinks. Calculate the number of people like both type of drinks.

6. Calculate $\lim\limits_{x\to 0} \dfrac{e^{\sin x}-1}{x}$. (3)

OR

If $y = \log(tan x)$, then Calculate $\frac{dy}{dx}$ (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. A sum of money is invested at compound interest. After 3 years, the amount is Rs. (5)
   12,000, and after 5 years, it is Rs. 14,400. Recognize the rate of interest per annum
   and the initial sum of money.

8. Evaluate $\int_0^1 \sqrt{x}(1 - x)dx$ (5)

9. Calculate the sum of the first 20 terms of the geometric progression: 2, 6, 18, 54, ... (5)

10. If $2^x \times 4^y = 16$ and $2^y \times 4^x = 32$, identify the values of $'x'$ and $'y'$. (5)

11. Construct at least one set A such that $\{1,2\} \subseteq A \subseteq \{1,2,3,4,5\}$. (5)

12. In the determinant $\begin{vmatrix} 1 & -1 & 0 \\ 4 & 2 & 5 \\ 9 & 7 & 3 \end{vmatrix}$ prepare the minor and co-factor of -1 (5)

OR

Test the matrix $\begin{pmatrix} 2 & -3 & 4 \\ 1 & 0 & 1 \\ 0 & -1 & 4 \end{pmatrix}$ is invertible or not. (5)

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