



BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Com.(AFB)-Hons]-2023
Course Name – Business Mathematics
Course Code - BBF10001
(Semester I)

Library
Brainware University
399, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125

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) If A is a square matrix, then choose the correct option.
a) $A A^T$ is symmetric
b) $A A^T$ is skew-symmetric
c) $A - A^T$ is symmetric
d) $A \cdot A^T$ is skew-symmetric
- (ii) Identify the ratio compounded of 4:5, 5:6, 6:7, 7:8
a) 1:2
b) 1:3
c) 2:3
d) 2:1
- (iii) If $a:b:c=3:4:7$, then identify the value of $(a+b+c):c$
a) 2:1
b) 1:2
c) 3:1
d) 1:1
- (iv) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then examine the value of x
is:
a) 15
b) 16
c) 25
d) 18
- (v) If $\frac{2}{3}$ of A = 75% of B = 0.6 of C, then estimate A:B:C is
a) 2:3:3
b) 3:4:5
c) 4:5:6
d) 9:8:10
- (vi) 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 examine the ratio of boys and girls.
a) 12:7
b) 10:7
c) 8:7
d) 4:3
- (vii) The incomes of A and B are in the ratio 3:2 and their expenditure are in ratio 5:3. If each saves Rs.1000, then identify A's income.
a) Rs. 3000
b) Rs. 4000
c) Rs. 6000
d) Rs. 9000
- (viii) If $a : b = 7 : 9$ and $b : c = 15 : 7$, then examine $a : c$.
a) 7:21
b) 21:7
c) 3:5
d) 5:3
- (ix) Write the equivalent set of the set {2, 3, 5, 7, 11}.
a) {x: x is an odd number lying between 1 and 13}
b) {21, 23, 25}
c) {x: x is a prime number less than 12}
d) None of these
- (x) A vendor bought toffees at 6 for a rupee. Identify the amount for a rupee must he sell to gain 20%?
a) 3
b) 4
c) 5
d) 6
- (xi) Identify the value of 'x': $3(x - 2) = 2 - (x + 1)$
a) $x = 5$
b) $x = 1$
c) $x = 0$
d) None of these
- (xii) The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. Identify the selling price if the article be sold to make 25% profit.
a) Rs. 2000
b) Rs. 2200
c) Rs. 2400
d) None of these
- (xiii) Examine which of the following two sets are equal.
a) $A = \{1, 2, 3\}$ and $B = \{x: x \text{ is a natural number}\}$
b) $A = \{1, 2\}$ and $B = \{1, 2, 3\}$
c) $A = \{1, 2, 3\}$ and $B = \{x: x \text{ is a natural number and } 0 < x < 4\}$
d) $A = \{1, 2, 4\}$ and $B = \{1, 2, 3\}$
- (xiv) Construct the rule that describes the set $\{\dots, -3, -2, -1, 0, 1, 2\}$.
a) $\{x: x < 3\}$
b) $\{x: x < 3, x \text{ is a rational number}\}$

- c) $\{x: x \text{ is an integer and } x < 3\}$ d) None of these
 (xv) Identify the solution of the equation: $x^2 - 4x + 4 = 0$?
 a) $x = 5$ b) $x = 2$
 c) $x = 0$ d) None of these

Group-B
(Short Answer Type Questions)

3 x 5=15

2. If the difference between T.D. and B.D. on a sum due in 4 months at 3% p.a. is Rs.10, examine the amount of the bills. (3)
3. Arun sells an object to Benny at a profit of 15%, Benny sells that object to Chandan for ₹1012 and makes a profit of 10%. identify the amount that Arun purchased the object. (3)
4. Explain can the number of permutations be larger than the number of objects being arranged? (3)
5. Write the value of $\int_0^2 e^x x dx$ (3)
6. Classify the set-in roster form: $A = \{x : x^2 - 4x - 5 = 0\}$ (3)

OR

Calculate the value of $\lim_{x \rightarrow 0^+} x^x$ (3)

Group-C
(Long Answer Type Questions)

5 x 6=30

7. By selling 90 ball pens for ₹160 a person loses 20%. Identify the number of ball pens should be sold for ₹96 so as to have a profit of 20% (5)
8. The prime cost of an article was three times than the value of materials used. The cost of raw materials increases in the ratio of 3 : 7 and productive wages as 4 : 9. Locate the present prime cost of an article which could formerly be made for Rs.18. (5)
9. Write the value of $\int \frac{dx}{x \log \log x}$ (5)
10. Write the value of $\int 2^{3x} 2^{3x} dx$ (5)
11. If $f(x, y) = x^2 y^2$ then calculate df (5)
12. If $f(x, y) = x^2 y^3$ then calculate $f_{xx}(x, y) + 2f_{xy}(x, y) + f_{yy}(x, y)$ (5)

OR

If $z = e^{x+y}$ then calculate $xu_x + yu_y$ (5)

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