BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Bachelor of Commerce (Honours) in Banking & Financial Accounting

Course Name – Business Mathematics

Course Code – BCM402

(Semester – 4)

Time allotted: 3 Hours   **Full Marks: 70**

[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)   10 x 1 = 10

1. *Choose the correct alternative from the following*

(i) Sum and product of roots of equation $x^2 - kx + k^2 = 0$ are

    a. k, k^2 b. k^2, k

    c. $-k, k^2$ d. $k, -k^2$

(ii) In transpose of matrix A, columns of matrix A becomes

    a. Multiple Column   b. rows

    c. multiples   d. divisors

(iii) If $^nP_2 = 30$ then n=?

    a. 6   b. 4

    c. 5   d. 720

(iv) How many terms are there in 20, 25, 30......... 140?

    a. 22   b. 25

    c. 23   d. 24

(v) What is the value of AB if A = {1, 2} and B = {a, b}?

    a. {(1, a), (1, b), (2, a), (b, b)}   b. {(1, 1), (2, 2), (a, a), (b, b)}

    c. {(1, a), (2, a), (1, b), (2, b)}   d. {(1, 1), (a, a), (2, a), (1, b)}

(vi)   Unit matrix written in format of square matrix is also called as

    a. Identity matrix   b. unidentified matrix

    c. direction matrix   d. dimension matrix

(vii)   Common difference of sequence 5,8,11,14,… is

    a. 3   b. -3

    c. 0   d. 1

(viii) Find out the sum of the two roots of the equation $x^2 - 5x + a = 0$

    a. 5   b. -1

    c. -5   d. 1

(ix)   5 persons can be seated at a round table in

    a. 25 ways   b. 24 ways

    c. 20 ways   d. None of the above

(x)   A set having no element is called

    a. Null set   b. Sub set

    c. Universal set   d. Proper set

Group – B

(Short Answer Type Questions)   3 x 5 = 15

Answer any *three* from the following

2.   For Ω = {1, 2,3,4,5,6,7,8,9}; A = {1, 2, 3, 5, 7}; B = {2, 3, 4, 5, 6}, C = {2, 4, 6, 8}; Verify that A – (B $\cup$ C) = (A - B) $\cap$ (A - C)   5

3.   If α and β are the roots of the equation $px^2 + qx + r = 0$ then determine the value of $(\alpha^3\beta + \alpha\beta^3)$ 5

4.   If A = $\begin{pmatrix} -1 & 0 & 3 \\ 2 & -3 & 0 \\ 3 & 2 & 2 \end{pmatrix}$ and B = $\begin{pmatrix} 2 & -1 & 0 \\ 3 & -2 & 1 \\ -3 & 0 & 2 \end{pmatrix}$

    Then validate that $(A + B)^T = A^T + B^T$

5.   Express the following binomial: $(1 + x)^4$ 5

6.   If $y = e^x / (1+x^2)$ then solve dy/dx.   5

Group – C

(Long Answer Type Questions)   3x 15 = 45

Answer any *three* from the following

7.	(a)	How many different teams containing 3 boys and 4 girls can be made from a BBA class of 20 boys and 10 girls?	4
	(b)	A team of 5 is to be made for representing a college event from 20 boys and 10 girls. In how many ways can the team be made if it has to have i) 3 boys and 2 girls ii) At least 2 girls iii) All boys only	5
	(c)	In a cricket team of 14 players, there are 6 bowlers. How many different teams of 11 players can be formed taking at least 4 bowlers in the team?	6
8.	(a)	The sum of three numbers in AP series is 15 and the product of first and third number is 24, then detect the numbers.	5
	(b)	Sum the series 2+4+6+…. Up to 40 terms.	5
	(c)	The first term of a GP is 2. If the sum of its third and fifth term is 180, find the value of the common ratio of the GP.	5
9.	(a)	If $y=\log\{x+\sqrt{(x^2+a^2)}\}$ then prove that $(x^2+a^2)\, y_2+xy_1=0$	10
	(b)	Calculate the compound interest on Rs. 25, 000 at 5% per annum at the end of 2.5 years if interest is calculated half yearly.	5
10.	(a)	If α and β are the two roots of $x^2 -2x + 3 = 0$, then demonstrate the equation with roots $\alpha+2$, $\beta+2$.	5
	(b)	Calculate the middle term of the series $(2x+3y)^4$.	5
	(c)	If the roots of the equation $x^2 -px + q = 0$ differ by unity then test that $p^2 = 4q + 1$.	5
11.	(a)	If $f(x) = x^2-x$, then test that $f(h+1) = f(-h)$.	5
	(b)	Evaluate lim $\{(x2 + 3x + 4)/(x + 1)\}$ (where x tends to 2).	5
	(c)	If $y= e^x\, x^e\, a^x$ then calculate dy/dx.	5