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Sr. No 352112

Dec-2023(Reappear)

B.Com(Honours) 1st SEMESTER

Business Mathematics (BCOMH-104)

Time: 3 Hours **Max. Marks:75**

Instructions:
1. *It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.*
2. *Answer any four questions from Part -B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

Que.1(a)Define Universal set and complement of a set .Illustrate with an example.

(b)If A = {3,6,9,12,15,18,21} and B = {4,8,12,16,20}, then find (i) A-B (ii) B-A.

(c)Define Cartesian product of two sets A and B.

(d)Define any three laws of indices, give one example of each.

(e) Find the value of $\log_8 128$.

(f)Find the sum of a series 51+50+49+……..+21.

(g) In how many ways the letters of the word 'COMBINE' can be arranged?

(h)Define Combination with an example.

(i)If $A = \begin{bmatrix} 7 & 2 \\ 3 & 4 \end{bmatrix}$, then find 3A and -3A.

(j)What is the value of the determinant of an identity matrix? Give an example. (1.5*10 = 15)

PART-B

Que.2 (a) For any sets A, B, C ,Prove that $A - (B \cup C) = (A - B) \cap (A - C)$. (7)

(b)In a class of 50 students,30 like Mathematics,25 like economics and 16 like both, find the number of students who like (i)Either Mathematics or Economics (ii)Neither Mathematics nor Economics. (8)

Que.3(a)If $x^{1/3}+y^{1/3}+z^{1/3} = 0$,then prove that $(x+y+z)^3 = 27xyz$. (7)

(b)If $x^2+y^2 = 11xy$, then prove that $2\log(x-y) = 2\log 3 + \log x - \log y$. (8)

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Que.4(a)Find the number of arrangement that can be made out of letters of the word ARRANGEMENT. In how many of them, vowels occur together? (7)

(b)Out of 6 boys and 4 girls, a committee of 5 is to be formed. In how many ways can it be done if(i)exactly two girls are included(ii)at least two girls are included(iii)at most two girls are included. (8)

Que.5(a)Evaluate the determinant $\begin{vmatrix} 1 & a & bc \\ 1 & b & ac \\ 1 & c & ab \end{vmatrix}$. (7)

(b)Solve the system of equations: $2x + y + z = 1, x - 2y - z = 1, 3y - 5z = 9$. (8)

Que.6(a)State and Prove DeMorgan's laws by using Venn-diagrams. (7)

(b)If the third ,sixth and last term of a G.P. are 6, 48, 3072 respectively, then find the first term and the number of terms in the G.P. (8)

Que.7(a)Solve the given quadratic equation: $4x^2 - 4a^2x + (a^4 - b^4) = 0$. (7)

(b)Find the inverse of the matrix $\begin{bmatrix} -2 & 1 & -3 \\ 0 & -1 & 2 \\ -1 & 2 & 0 \end{bmatrix}$ and verify that $A^{-1}A = I$. (8)

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