SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Com.(PA) END SEMESTER EXAMINATIONS APRIL-2023
SEMESTER - I
21UPAAT1001 - Business Mathematics

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. If A $= \{1, 4\}$ $B = \{4, 5\}; C = \{5, 7\}$, show that
   A x (B∩C) = (A x B) ∩ (A x C)
2. Solve: $8x^2$ – 10x + 3 = 0 by Quadratic formula.
3. If A $= \begin{pmatrix} 1 & -1 \\ 2 & -1 \end{pmatrix}$, B $= \begin{pmatrix} a & 1 \\ b & -1 \end{pmatrix}$ and applying $(A + B)^2 = A^2 + B^2$,
   find a and b.
4. If a : b = 1 : 2, b : c = 3 : 2 and c : d = 5 : 4 show, a : b: c: d.
5. If the common ratio in a G.P is 3 and the sum of the first 7 terms is 5465. Find the first term.
6. An overdraft of Rs.30,000 is to be paid back in equal instalments in the course of 10 years.Compute the amount of each instalment reckoning compound interest at 12% per annum.
7. If the demand function is P = 35 – 3x and the cost function is C = $2x^2$ + 5x, show the level of output and the price at the firm's equilibrium point.
8. Differentiate the following w.r.t. x
   $\frac{(5x^3 + 3x^2 - 4x + 5)}{\sqrt{x^5}}$

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. 12 coins are tossed at a time. Interpret the probability for the following outcomes in a single toss.
   (i) Less than 4 Heads (ii) 9 or more Heads
   (iii) At least 7 Heads (iv) No Heads
10. Solve the following equations by Cramer's Rule.
    2x + 4y + z = 26; 3x + 2y + 3z = 32; 2x – 3y + 4z = 16

Contd...

11. Prove that: (a) $\frac{log_3{}^8}{log_9{}^{16}log_4 10} = 3log_{10}{}^2$

    (b) $\frac{1}{log_{xy}xyz} + \frac{1}{log_{yz}xyz} + \frac{1}{log_{zx}xyz} = 2$

12. A Company wants to replace a machinery purchased for Rs.1,50,000, at the end of the 10^{th} year. Hence, a sinking fund is created by investing an equal amount for a compound interest @ 8% for a period of 10 years. Compute how much amount the company invest every year to realise the depreciated value of the machinery. The depreciation is charged @ 10% p.a. on the diminishing balance method.

13. Ascertain the maximum and minimum values of the function
    $x^4 + 2x^3 - 3x^2 - 4x + 4$

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