Roll.No. | | **23UBHCT3013**

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.Honours - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - III
23UBHCT3013 - Business Mathematics

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

Section B

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

1. Verify by Venn diagram: $A \cup (B \cap C) = (A \cup B) \cap (A \cap C)$
2. Find the term independent of x in the expansion of $(2x^2 + \frac{1}{x})^{12}$
3. Prove that the curve given $3y = x^3 - 3x^2 - 9x + 11$ has a maximum at x=1, minimum at x=3 and a point of inflection at x=1.
4. A person borrows Rs.2,500 at 10% simple interest for 2 years. He immediately lends this money out at compound interest at the same rate and for the same time. What is the gain at the end of 2 years?
5. The ratio of the prices of two houses was 16 : 23. Two years later, when their prices of the first has reason by 10% and that of the second by Rs.477, the ratio of their prices becomes 11 : 20. Find the original prices of the two houses.
6. There are 3 boxes containing respectively 1 white, 2 red, 3 black balls; 2 white, 3 red, 1 black ball; 3 white, 1 red and 2 black ball. A box is chosen at random and from it 2 balls are drawn at random. The 2 balls are 1 red and 1 white, what is the probability that they comes from the first bag.
7. Different the following with respect to x:
   $(i)(3x^2 + 4x - 5)^3$
   $(ii)e^{(3x^2+2x+3)}$
8. A company set aside for a reserve fund the sum of rupees Rs.20,000 annually to enable it to pay off a debenture issue of Rs.2,39,000 at the end of 10 years. Assuming that the reserve accumulates at 4% p.a. compounded, find the surplus after paying off the debenture issue.

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Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Out of 880 boys in a school 224 played cricket, 240 played hockey and 336 played basketball; Of the total 64 played both basketball and hockey, 80 played cricket and basketball and 40 played cricket and hockey. 24 played all the three games. How many did not play any of the games and how many played only one game?

10. The value of diamond various as the square of its weights. A diamond is broken into 5 pieces, the weights of which are in the ratio 1:2:3:4:5. If the resulting loss be Rs.85,000, find the value of the original diamond. Also calculate the value of the diamond whose weight is twice that of the original diamond.

11. A man borrows Rs.5,115 to be paid in 10 monthly instalments. If each instalment is doubled the value of the last, find the value of the first and the last instalments.

12. Solve the set of linear equations by matrix method.
$2x + 4y + z = 5; x + y + z = 6; 2x + 3y + z = 6$

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. The cost function for producing x units of a product is $C(x) = x^3 - 12x^2 + 48x + 11$(in rupees)and the revenue function $R = 83x - 4x^2 - 21$.
Find the output for which profit is maximum.

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