M – 2501

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Reg. No. : .....

Name : .....

**Second Semester B.Com. Degree Examination, December 2021**

**First Degree Programme under CBCSS**

**Complementary Course**

**CO 1231/CC 1231/CX 1231 : BUSINESS MATHEMATICS**

**(2020 Admission Regular)**

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions. Each question carries **1** mark.

1. A number which has atleast one divisor other than 1 is a ———— number.
2. When three strings of 240 cm, 318 cm and 426 cm are cut into equal lengths, ———— cm is the greatest possible length of each piece.
3. $ax + by = c$ is the general form ———— equation in two variables.
4. The maximum number of solutions to a quadratic equation is ————.
5. If $A$ is a matrix of order $m \times n$ and $B$ is a matrix of order $n \times p$, then $AB$ is of order ————.
6. ———— is a sequence of equal payments made at equal intervals of time.
7. If $A \cap B = \phi$, then $A$ and $B$ are said to be ———— sets.
8. A function which assigns a fixed value for every value of $x$ is called ———— function.
9. A diagonal matrix whose diagonal elements are equal, is called ————.
10. The set of all subsets of given set $A$ is the, ———— set of $A$.

**(10 × 1 = 10 Marks)**

P.T.O.

II. Answer **any eight** questions. Each question carries **2** marks.

11. The sum of 3 consecutive numbers is 162. Find them.

12. Find the least number which is a perfect square and is divisible by each of numbers 16, 20, 24?

13. Solve $4x + 8 = 6(x - 4)$.

14. $A = \begin{bmatrix} 2 & -1 \\ 0 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$

    Find $3A + 4B$.

15. Find $x$ if the matrix $\begin{bmatrix} 1 & 4 \\ 8 & x \end{bmatrix}$ is singular.

16. At what rate per annum will simple interest on Rs. 1,00,000 for 73 days be Rs. 400?

17. $A = \{a, b, c, d, e, f\}$

    $B = \{a, e, i, o, u\}$

    Perform (a) $A \cup B$ (b) $A \cap B$.

18. Find in what time a sum of money trebles itself at 5% p.a. compound interest.

19. What is a pie diagram?

20. Define determinant.

21. What is a quadratic equation?

22. What do you mean by future value of money?

23. Define break-even price.

24. Explain any two financial ratios.

25. Define subset.

26. How do you get transpose of a matrix?

**(8 × 2 = 16 Marks)**

III. Answer **any six** questions. Each question carries **4** marks.

27. The cost of a machine is Rs. 40,000. It depreciates 20% annually. What is its value four years hence?

28. If $A=\begin{bmatrix} 5 & -8 & -1 \\ 2 & -3 & -1 \\ -3 & 5 & 1 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 3 & 5 \\ 1 & 2 & 3 \\ 1 & -1 & 1 \end{bmatrix}$

Find $AB$.

29. The difference of the ages of Anil and his father is 30 years. If the difference of the squares of their ages is 1560, find their ages.

30. $A=\begin{bmatrix} 1 & 7 \\ 2 & 6 \end{bmatrix}$ $B=\begin{bmatrix} 1 & 5 \\ 1 & 6 \end{bmatrix}$.

Find $AB$ and $|AB|$.

31. Express 5.333... as a rational fraction.

32. Find the largest number having 4 digits divisible by 12, 15, 18 and 27.

33. A company sets aside a sum of Rs. 20,000 annually to enable it to pay off a debenture issue of Rs. 2,30,000 at the end of 10 years. Assuming that the sum accumulates at 4% per annum compound, find the surplus after paying off the debenture stock.

34. If $A=\{1, 2, 3, 4, 5\}$, $B=\{2, 4, 6, 8, 10\}$, $C=\{3, 6, 9, 12, 15\}$

Find

(a) $(A \cup B) \cap C$

(b) $A \cup (B \cap C)$

35. Solve $2x+3y=5$, $xy=1$.

36. Solve $2x^2 + 3x - 1 = 0$.

37. Explain the terms permutation and combination.

38. Explain any two methods for depreciation.

**(6 × 4 = 24 Marks)**

IV. Answer **any two** questions. Each question carries **15** marks.

39. (a) In how many ways can 3 boys and 5 girls be arranged in a row so that all the 3 boys are together.

(b) How many 4 digit numbers can be formed with the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 if no two digits are same?

40. By selling a table for Rs. 56, gain is as much percent as its cost in rupees. What is the cost price?

41. A market research group conducted a survey of 1000 consumers and reported that 720 consumers liked product A and 450 consumers liked product B. What is the least number that must have liked both products?

42. Solve the following by Cramer's rule.

$x + y + z = 3$

$x + 2y + 3z = 4$

$x + 4y + 9z = 6$

43. Find $A^{-1}$ and hence prove that $A \cdot adj\, A = |A| \cdot I$, if $A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$

44. A man repaid his house building advance in equal instalments of Rs. 40,000 per annum for 5 years. If the money is worth 8% per annum compounded annually and repayment starts after initial gap of 2 years. Find the sum borrowed.

**(2 × 15 = 30 Marks)**