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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)

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 Ma

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)