

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2012**First Semester****Complementary Course—FUNDAMENTALS OF BUSINESS MATHEMATICS**

Time : Three Hours

Maximum Weight : 25

Part A*Answer all questions.**Each bunch of four questions carries a weight of 1.***Bunch I**

1. If $a + b : a - b = 5 : 2$, then $b : a$ is _____.
2. The value of $\log_7 343$ is _____.
3. Two-third of a number increased by 5 equals 27. The number is _____.
4. The 10th term of the series $3, 1, -1, -3, \dots$ is _____.

Bunch II

5. The number of 4 digit numbers that can be formed from the digits 4, 5, 6, 7, 8, 9 when the digits may be repeated is _____.
6. Any square matrix is said to be _____ if it is equal to its transpose.
7. For a square matrix A, if there exist a square matrix B such that $AB = BA = I$, then B is _____.
8. If $A = \{1, 3, 5, 7\}$ $B = \{5, 9, 13, 17\}$, $A - B$ is _____.

Bunch III

9. If $\log_5 (x - 7) = 1$, then x is _____.
10. The solution of $4 = \frac{2}{3}x + 2$ is _____.
11. If $2, 5, 8, \dots$ is an A.P., the 20th term is _____.
12. The number of words that can be formed with letters of the word RAJESH is _____.

Bunch IV

13. If $\begin{bmatrix} 4 & 5 \end{bmatrix} + \begin{bmatrix} x & y \end{bmatrix} = \begin{bmatrix} 7 & 3 \end{bmatrix}$, then x, y is _____.
14. If $A = \{a, b\}$ and $B = \{2, 3\}$, then $A \times B$ is _____.
15. If $12x = 5y$, $x : y =$ _____.
16. Define a rational number.

(4 × 1 = 4)

Turn over

Part B

Answer any five questions.
Each question carries a weight of 1.

17. If $U = \{3, 4, 5, 6, 7, 8, 10, 11, 12, 13\}$, $A = \{3, 4, 5, 6\}$ and $B = \{3, 7, 9, 5\}$, write $(A \cup B)'$.
18. If 6, $4k - 2$, 35, $6k + 5$ are four proportionals, find k .
19. In how many ways can a person invite one or more of his 6 friends?
20. Insert 4 arithmetic means between 5 and 20.
21. Calculate the simple interest on a sum of Rs. 5000 at 8 % for 2 years.
22. If $P = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$, $Q = \begin{bmatrix} -1 & 2 \\ 4 & 3 \end{bmatrix}$, $R = \begin{bmatrix} 2 & -1 \\ 6 & 5 \end{bmatrix}$, find $PQ + PR$.
23. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 \\ 2 & -3 \end{bmatrix}$, $C = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$. Show that $A(B + C) = AB + AC$.
24. Simplify $\log_2 16 + \log_2 32 + \log_2 \left(\frac{1}{8}\right)$.

(5 × 1 = 5)

Part C

Answer any four questions.
Each question carries a weight of 2.

25. If $A = \begin{bmatrix} 2 & 2 & 1 \\ -2 & 1 & 2 \\ 1 & -2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 & 2 \\ 1 & 1 & 1 \\ 2 & -3 & -1 \end{bmatrix}$, verify $(AB)^{-1} = B^{-1} A^{-1}$.
26. The monthly salaries of two persons are in the ratio 3 : 5. If each receives an increase of Rs. 20 in the monthly salary, the ratio is altered to 13 : 21. Find their salaries.
27. In $nP_4 = 12 \cdot nP_2$, find n .
28. The compound interest on Rs. 1,800 at 10 % per annum for a certain period of time is Rs. 378. Find the time in years.
29. If the sum of an A.P. is the same for p as for q terms, show that its sum for $p + q$ terms is zero.
30. If $A = \begin{bmatrix} 3 & 1 & 2 \\ 2 & 0 & 1 \\ -2 & 5 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & -1 \\ 2 & 3 & -4 \\ 3 & 2 & 1 \end{bmatrix}$, verify $(AB)^T = B^T A^T$.

(4 × 2 = 8)

Part D

*Answer any two questions.
Each question carries a weight of 4.*

31. Find the inverse of the matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.

32. Find the sum of n terms of the series :

$$7 + 77 + 777 + 7777 + \dots$$

33. Find the value of $(1.02)^{-4}$ correct to 4 significant figures.

$(2 \times 4 = 8)$