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Reg. No.....

Name.....

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2019

First Semester

Complementary Course—FUNDAMENTALS OF BUSINESS MATHEMATICS

(Prior to 2013 Admissions)

Time : Three Hours

Maximum Weight : 25

Part A

Answer all questions.

Each bunch of four questions carries a weight of 1.

Bunch I

1. How many 3 digit numbers can be formed from the digits 1, 2, 3, 4 assuming repetition of the digits is allowed ?
2. Find the sum of all natural numbers lying between 100 and 1,000 which are multiples of 5.
3. A sum of money amounted Rs. 1,071 in 6 months and Rs. 1,106 in 16 months. Calculate the rate of simple interest.
4. The maximum value of $f(x) = x + \frac{1}{x}$ for $x > 0$ _____.

Bunch II

5. If $AB = BA = |A| I$, then the matrix B is.
6. What is the value of $\log_2 1024$ _____ ?
7. If the product of a square matrix and its transpose is a unit matrix, then A is said to be _____
8. Let $A = \{1, 2, 3\}$ and $R = \{(1, 1), (2, 2), (3, 3), (1, 2)\}$, what type of relation is R ?

Bunch III

9. Which term of the progression $-1, -3, -5, \dots$ is -39 .
10. If the roots of $x^2 - 10x + K = 0$ are in the ratio $2 : 3$, the value of K will be _____.
11. If $2 \log x = 4 \log 3$, then x is equal to _____.
12. If A and B are disjoint sets, $A \cap B$ is _____.

Bunch IV

13. If $A = \begin{bmatrix} 8 & 0 & 2 \\ 6 & -1 & 4 \end{bmatrix}$, $3A =$

14. Define a complex number.

Turn over

15. The number which can be expressed in the form of p/q , where $q \neq 0$ can be called as _____.
16. What is the present value of Re. 1 to be received after two years compounded annually at 8 ?
(4 × 1 = 4)

Part B

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

17. If $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then verify that $(A + B)' = A' + B'$.
18. Given that $A = \{0, 1, 3, 5\}$, $B = \{1, 2, 4, 7\}$ and $C = \{1, 2, 3, 5, 8\}$, prove that $(A \cap B) \cap C = A \cap (B \cap C)$.
19. Mohan deposited Rs. 5,00,000 in his bank for 3 years at simple interest rate of 6 %. How much interest would he earn ?
20. Solve for x if $\log_{1/2} [\log_x (\log_4 32)] = 2$.
21. Find first five terms of the sequence $a_n = n \frac{n^2 + 5}{4}$.
22. Find the value of a, b, c and d from the equation :
- $$\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}.$$
23. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consist of exactly 3 girls ?
24. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$ then $\frac{a+b+c}{c} = \underline{\hspace{2cm}}$.

(5 × 1 = 5)

Part C

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

25. If $A = \begin{bmatrix} 2 & 0 \\ 8 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 3 \\ 2 & 4 \end{bmatrix}$. Verify that $(AB)^{-1} = B^{-1} A^{-1}$.
26. A precious stone worth Rs. 25,000 is accidentally dropped and broken into 3 pieces, the weight of which are proportional to 5 : 9 : 11. The value of the stone is proportional to the square of the weight. Calculate the loss incurred by the brokerage.
27. If $nC_3 : n - 1C_2 = 8 : 3$ find n .

28. A machine depreciates each year by 10 % of its value at the beginning of the year. At the end of the Fourth year its value is 328050. Find the original value.
29. If the sum of n terms of an A.P. is $3n^2 + 5n$ and its n th term is 164. Find value of m .
30. If $A' = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$, then find $(A + 2B)'$.

(4 × 2 = 8)

Part D

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

31. Find the inverse of the matrix $\begin{bmatrix} 1 & 3 & -2 \\ -3 & 0 & -5 \\ 2 & 5 & 0 \end{bmatrix}$.
32. If $a\left(\frac{1}{b} + \frac{1}{c}\right), b\left(\frac{1}{c} + \frac{1}{a}\right), c\left(\frac{1}{a} + \frac{1}{b}\right)$ are in A.P. Prove that a, b, c are in A.P.
33. Using binomial theorem indicate which number is larger $(1.1)^{10000}$ or 1000.

(2 × 4 = 8)