

E 2628

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Reg. No.....

Name.....

**B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2011**

**First Semester**

**Complementary Course—FUNDAMENTALS OF BUSINESS MATHEMATICS**

Time : Three Hours

Maximum Weight : 25

**Part A**

*Answer all questions.*

*Each bunch of 4 questions carries weight 1.*

**Bunch I**

1. Find the derivative of  $2^x \log x$ .
2.  $\log\left(\frac{1}{81}\right)$  to the base 9 is equal to \_\_\_\_\_.
3.  $a:b=3:4$ , the value of  $(2a+3b):(3a+4b)$  is \_\_\_\_\_.
4. If a matrix has 12 elements, what are the possible orders it can have?

**Bunch II**

5. If  $A = \{1, 2, 3, 5, 7\}$ ,  $B = \{1, 3, 6, 10, 15\}$ . Then the Cardinal Number of  $A-B$  is \_\_\_\_\_.
6. Let  $A = \{1, 2, 3\}$  and  $R = \{(1, 1), (2, 2), (3, 3), (1, 2)\}$ . What type of relation is  $R$ ?
7. Which term of the progression  $-1, -3, -5, \dots$  is  $-39$ .
8. How many different numbers can be formed using any 3 out of five digits 1, 2, 3, 4, 5 no digit being repeated in any number?

**Bunch III**

9. The value of  $\log_2[\log_3(\log_3 27^3)]$  is equal to \_\_\_\_\_.
10. If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 + 12x + 7 = 0$ , form the equation whose roots are  $(\alpha + \beta)^2$  and  $(\alpha - \beta)^2$ .
11. The numbers  $x, 8, y$  are in G.P. and the numbers  $x, y, -8$  are in A.P. The value of  $x$  and  $y$  are \_\_\_\_\_.
12. If  $2 \log x = 4 \log 3$ , then  $x$  is equal to \_\_\_\_\_.

**Bunch IV**

13. The formula for finding the sum of squares of first 'n' natural numbers is \_\_\_\_\_.
14. If  $A = \frac{B}{2} = \frac{C}{5}$ , then  $A : B : C$  is \_\_\_\_\_.

**Turn over**

15. If  $\sqrt{3}$  is not rational then  $5 + \sqrt{3}$  is \_\_\_\_\_.
16. What is the present value of Re 1 to be received after two years compounded annually at 10 ?  
(4 × 1 = 4)

### Part B

Answer any five questions.  
Each carries weight 1.

17. If  $P = (1, 3, 6)$  and  $Q = (3, 5)$  prove that  $P \times Q \neq Q \times P$ .
18. If  $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$ , then  $\frac{a+b+c}{c} = \underline{\hspace{2cm}}$ .
19. A family of 4 brothers and 3 sisters is to be arranged for a photograph in one row. In how many ways can they be seated if no two sisters sit together ?
20. Insert 4 arithmetic means between 4 and 324.
21. Sachin deposited Rs. 1,00,000 in his bank for 2 years at simple interest rate of 6%. How much interest would he earn ?

22. If  $A = \begin{bmatrix} 1 & 2 & 3 \\ -2 & 1 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 3 & 1 \\ 5 & 4 & 2 \\ 1 & 5 & 3 \end{bmatrix}$  compute  $AB$ .

23.  $A + B = \begin{bmatrix} 1 & -1 \\ 3 & 0 \end{bmatrix}$  and  $A - B = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix}$  find  $AB$ .

24. Solve for  $t$  if  $\log_{1/2} [\log_4 (\log_4 32)] = 2$ .

(5 × 1 = 5)

### Part C

Answer any four questions.  
Each carries weight 2.

25. If  $A = \begin{bmatrix} 2 & 0 \\ 3 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix}$  verify that  $(AB)^{-1} = B^{-1} A^{-1}$ .
26. The monthly incomes of two persons are in the ratio 4 : 5 and their monthly expenditure are in the ratio 7 : 9. If each saves Rs. 50 per month, find their monthly income.
27. Find  $x$  if  $12C_5 + 2 \times 12C_4 + 12C_3 + \dots + 14C_x$
28. Rs. 5,000 is invested in a Term Deposit Scheme that fetches interest 6% per annum compounded quarterly. What will be the interest after one year ?

29. Divide 69 into three parts which are in A.P. and are such that the product of the 1<sup>st</sup> two part is 483.

30. If  $A = \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$ , find  $A^{-1}$  and verify that  $A^{-1} = \frac{1}{13}A - \frac{4}{13}I$ .

(4 × 2 = 8)

**Part D**

*Answer any two questions.  
Each carries weight 4.*

31. Find the inverse of  $A = \begin{bmatrix} 1 & 2 & 5 \\ 2 & 3 & 1 \\ -1 & 1 & 1 \end{bmatrix}$ .

32. Find the sum of  $n$  terms of the series  $0.7 + 0.77 + 0.777 + \dots$  to  $n$  terms.

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

(2 × 4 = 8)