

**E 8243**

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Reg. No.....

Name.....

**B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2014**

**Second Semester**

**Complementary Course—MATHEMATICS FOR MANAGEMENT**

(2013 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A (Short Answer Questions)**

*Answer all questions. 1 mark each.*

1. State distance formula.
2. What is the co-ordinates of mid-point of join of points  $(-2, 5)$  and  $(6, 3)$  ?
3. Write the equation of a line in slope-intercept form.
4. Write the equation of a circle passing through the origin.
5. What do you mean by an even function ?
6. What is the derivative of a constant function ?
7. State product rule for the derivative of product of two functions.
8. What is the value of  $\int 1 dx$  ?
9. State integration by parts formula for the integration of product of two functions.
10. What is the value of  $\int a^x dx$  ?

(10 × 1 = 10)

**Part B (Brief Answer Questions)**

*Answer any eight questions. 2 marks each.*

11. Plot the points A  $(-4, 6)$  and B  $(0, -5)$  in XY-plane.
12. Find the ratio in which the point  $(11, -3)$  divides the join of points  $(3, 4)$  and  $(7, 11)$ .
13. The co-ordinates of two points A and B are  $(-1, 2)$  and  $(2, -1)$  respectively. Find the equation and slope of the line AB.
14. Find the co-ordinates of the centre and the radius of the circle given by  $4x^2 + 4y^2 + 16x - 24y + 3 = 0$ .
15. Compare variables and constants with example.

**Turn over**

16. Draw the graph of the function  $y = |x|$ .

17. Find the differential coefficient of  $\frac{x^2 - 1}{x^2 + 1}$ .

18. Differentiate  $\sqrt{3x^2 - 7}$  with respect to  $x$ .

19. If  $y = \sin ax$ , prove that  $\frac{d^2 y}{dx^2} + a^2 y = 0$ .

20. Evaluate  $\int \sqrt{ax + b} dx$ .

21. Evaluate  $\int \frac{a + b \sin x}{\cos^2 x} dx$ .

22. Evaluate  $\int \log x dx$ .

(8 × 2 = 16)

### Part C (Descriptive/Short Essay Type Questions)

Answer any six questions. 4 marks each.

23. If  $(-3, 4)$  is the centroid of the triangle whose vertices are  $(6, 2)$ ,  $(x, 3)$ ,  $(0, y)$  find  $x$  and  $y$ .

24. Show that the points  $(3, -2)$ ,  $(-1, 1)$  and  $(-5, 4)$  are collinear.

25. Find the equation of the straight lines through  $(2, 5)$  and making equal intercepts of opposite sign on the axis.

26. Find the acute angle between the lines  $3x + 2y = 11 = 0$  and  $2x + y + 12 = 0$ .

27. Find the value of  $\lim_{x \rightarrow 1} \frac{x^3 - 1}{x^2 - 1}$ .

28. Find the derivative of  $\sec^{-1} \left( \frac{1+x^2}{1-x^2} \right)$  with respect to  $x$ .

29. Investigate the maxima and minima of the function  $2x^3 + 3x^2 - 36x + 10$ .

30. Evaluate  $\int \frac{dx}{x(x^4 + 1)}$ .

31. Evaluate  $\int \frac{xe^x}{(1+x)^2} dx$ .

(6 × 4 = 24)

**Part D (Long Essay)**

*Answer any two questions. 15 marks each.*

32. (a) Find the length of medians of a triangle whose vertices are (1, 2), (2, -1) and (3, 4).  
(b) Find the area of a triangular region bounded by the lines whose equations are  $x - y + 2 = 0$ ,  $4x + 3y + 8 = 0$  and  $9x - 2y - 17 = 0$ .
33. (a) Find the equation of the straight line passing through the intersection of  $4x - 3y - 1 = 0$  and  $2x - 5y + 3 = 0$  and parallel to the line  $4x + 5y = 6$ .  
(b) Find the equation of the circle passing through the points (0,0), (1,2) and (2,0).
34. A firm has the following functions :  $p = 100 - 0.01x$ ,  $TC = 50x + 30000$  where  $P$  = price,  $x$  = number of units. How many units are to be manufactured to maximize the profit ? If a tax of Rs. 10 per unit is levied, what should be the number of units to be manufactured to maximise the profit ?
35. The marginal revenue of a firm is given by  $MR = 9 - 4x^2$ , find the total revenue  $R$  in terms of  $x$ . What can be maximum revenue possible ?

(2 × 15 = 30)