

**E 6626**

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Reg. No.....

Name.....

**B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2017**

**Second Semester**

**Complementary Course—MATHEMATICS FOR MANAGEMENT**

(2013 Admission onwards)

Time : Three Hours

Maximum Marks : 80

**Part A**

*Answer all questions.*

*1 mark each.*

1. For any positive integer 'n',

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = \underline{\hspace{2cm}}.$$

2. Images of the point (2, 3, 4) w.r.t. XY plane is \_\_\_\_\_.

3. The distance of the point (x, y) from y-axis is \_\_\_\_\_.

4. Slope of the line  $4x + 3y + 5 = 0$  is \_\_\_\_\_.

5. Find the slope of the line joining (-2, 6) and (4, 8).

6. The distance between the points (-3, 7, 2) and (2, 4, -1) is

7. The centre of the circle  $x^2 + y^2 - x = 0$  is \_\_\_\_\_.

8. Find the value of  $\frac{d}{dx}(x^2 + x)$  at  $x = 1$ .

9. Value of  $\int 0 dx$  is \_\_\_\_\_.

10. Give an example for an odd function.

(10 × 1 = 10)

**Turn over**

**Part B**

*Answer any eight questions.  
2 marks each.*

11. Find the derivative of  $x - 3$  using first principle.
12. Find the equation perpendicular to the line  $3x - 4y + 2$  and having Y intercept 2.
13. Find the derivative of  $2x - 3x$  using quotient rule.
14. Find the co-ordinate of the point which divides the line segment joining the points  $(-2, 3, 5)$  and  $(1, -4, 6)$  in the ratio 2:3 internally.
15. Evaluate  $\int \frac{dx}{\sqrt{x+1}}$ .
16. Find the forth derivative of  $\sqrt{4x+2}$ .
17. Draw the graph of the function  $y = \frac{1}{x}$ .
18. Define function. What are the domain and range of a function ?
19. Integrate  $\sqrt{\sin 2x + 1}$  w.r.t.  $x$ .
20. Evaluate  $\lim_{x \rightarrow a} \frac{e^{3x} - 1}{x}$ .
21. Define Cartesian product of two sets.
22. Evaluate  $\int \tan^{-1} x dx$ .

(8 × 2 = 16)

**Part C**

*Answer any six questions.*

*4 marks each.*

23. Show that the triangle with vertices  $(1, 4, 2)$ ,  $(2, -3, 4)$  and  $(-2, 1, 2)$  is right angled.
24. Find the co-ordinates of the orthocentre of the triangle whose vertices are  $(-1, 3)$ ,  $(2, -1)$  and  $(0, 0)$ .
25. Write converse of, if two lines are parallel, then they do not intersect in same plane.
26. Evaluate  $\int \frac{e^x - e^{-2x}}{e^x + e^{-x}} dx$ .
27. Evaluate  $\int \frac{dx}{2 + e^{3x}}$
28. Find the maximum and minimum values of the function  $x^4 + 2x^3 - 3x^2 - 4x + 1$ .
29. Find the derivative of  $y = \tan x$  using first principle.
30. Find the equation of the line passing through the intersection of lines  $x + 2y - 3 = 0$  and  $4x - y + 7 = 0$  and which is parallel to  $5x + 4y - 20 = 0$ .
31. Find the co-ordinate of the foci, vertices and length of latus rectum of the hyperbola  $16xz - 9yz = 576$ .

$(6 \times 4 = 24)$

**Part D**

*Answer any two questions.*

*15 marks each.*

32. Evaluate  $\int \frac{x^3 + 3x}{(x+1)^2(x^2 - 2x + 1)} dx$ .
33. Find the point of intersection of pairs of lines  $4x - 3y + 7 = 0$  and  $2x + 7y - 5 = 0$  and also find a line perpendicular to  $4x - 3y + 7 = 0$  and passing through the origin.

**Turn over**

34. Find the maxima and minima values of the following functions :

(i)  $2x + \frac{4}{x+5}$ .

(ii)  $6x^5 - 12x^4 + 9x^3 + 45$ .

(iii)  $3x^3 + 42x^2 + \frac{5x}{x-4}$ .

35. Solve the system of equations using Cramer's method

$$x - y + 3z = 9, \quad 3x + 5y - 3z = 21 \quad 12x + 7y - 10z = 35.$$

(2 × 15 = 30)