

E 2581

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Reg. No.....

Name.....

B.B.A. DEGREE (C.B.C.S.S.) EXAMINATION, MAY 2016

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. Find the value of $\frac{d}{dx}(x^2 + 2)$ at $x = 1$.
2. Find the slope of the line joining $(-2, 6)$ and $(4, 8)$.
3. Find the slope of the line $7x - 3y + 5 = 0$.
4. Define Cartesian product of 2 sets.
5. Integrate $x_n \log x$ w.r.t. x .
6. Explain the range of a function.
7. What is the value of $\int 0 dx$?
8. State Section formula.
9. Write equation of a line in two point form.
10. Write the equation of a circle with centre at origin.

(10 × 1 = 10)

Part B

Answer any eight questions.

2 marks each.

11. Find the derivative of $\frac{1}{\sqrt{3x+1}}$.
12. $\lim_{x \rightarrow 0} \frac{\sin x}{x} = ?$
13. Find the derivative of $y = \tan x$ using first principle.

Turn over

14. Integrate $x^2 - 7x + 5$ w.r.t. x .
15. Evaluate $\int \frac{2x^2 + x + 1}{(x+1)^2} dx$.
16. Integrate $\sqrt{1 + 3\sin 2x}$ w.r.t. x .
17. Draw a graph with function $2y = \frac{3}{x}$.
18. Find the equation of the circle whose centre is $(4, 5)$ and radius 7.
19. Find the distance between the points $(-3, 7, 2)$ and $(2, 4, -1)$.
20. Find the equation of the line passing through the point $(2, 2)$ and whose sum of intercepts is $(9, 2)$.
21. Integrate $(x-3)\frac{2x}{2}$ w.r.t. x .
22. Find the value of y if :

$$\int y dx = x^2 + 1.$$

$(8 \times 2 = 16)$

Part C

Answer any six questions.
4 marks each.

23. Find the value of x if the line $3x + 4y - 12 = 0$ from the origin and the line $6x + 8y - 18 = 0$.
24. Find the ratio in which ZX-plane divides the line joining the points $(-2, 4, 7)$ and $(-3, -5, 8)$.
25. Find the centre and radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$.
26. Find the co-ordinates of the orthocentre of the triangle whose vertices are $(-1, 3)$ $(2, -1)$ and $(0, 0)$.
27. Evaluate $\int \frac{xe^x}{2x^2 + 4x + 1} dx$.
28. Find the derivative of $\sin^{-1}\left[\frac{2x}{1+x^2}\right]$ w.r.t. x .

29. Evaluate $\int \frac{dx}{2 - e^{2x}}$.
30. Find the area of the triangle whose vertices are (2, 3), (5, 7) and (-3, 4).
31. Prove that the quadrilateral with vertices are (2, -1), (3, 4), (-2, 3) and (-3, -2) is a rhombus.

(6 × 4 = 24)

Part D

Answer any **two** questions.
15 marks each.

32. Find the derivative of the following :

(i) $x^2 - 3x$.

(ii) $x^3 - 3x + 4$.

(iii) $\frac{1}{\sqrt{x-2}}$.

33. Integrate the following :

(i) $x^n \log x$.

(ii) $\frac{x^2}{(x-1)}$.

(iii) $\frac{xe^x}{(x+3)^3}$.

34. The total production cost of x units of an item is given by $C(x) = 80 + 12x + x^2$ and total revenue function is given by $R(x) = 42x$:

(i) Write the profit function.

(ii) Find the maximum profit obtained.

35. A family of four members planned to go for a visit to Goa by train. On the day of journey all the auto/taxi drivers were on strike. So the family couldn't get any transport to railway station. Now the family is standing at the crossing of 2 straight roads represented by $2x - 3y - 4 = 0$ and $3x + 4y - 5 = 0$ want to reach the path whose equation is $6x - 7y + 8 = 0$ in least time. Find the equation of path that they should follow and why.

(2 × 15 = 30)