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I BBA
MATHEMATICS AND STATISTICS FOR MANAGERS

16SCCBB4

Unit - I

BASIC FORMULAE

- 1) $D(x^n) = nx^{n-1}$
- 2) $D(x) = 1$
- 3) $D(\sin x) = \cos x$
- 4) $D(\cos x) = -\sin x$
- 5) $D(\tan x) = \sec^2 x$
- 6) $D(\sqrt{x}) = \frac{1}{2\sqrt{x}}$
- 7) $D(\text{const}) = 0$
- 8) $D(uv) = uv' + vu'$
- 9) $D\left(\frac{u}{v}\right) = \frac{vdu - udv}{v^2}$
- 10) $D(e^x) = e^x$
- 11) $D(e^{ax}) = ae^{ax}$
- 12) $D(\log x) = \frac{1}{x}$
- 13) $\sin^2 x = \frac{1 - \cos 2x}{2}$
- 14) $\cos^2 x = \frac{1 + \cos 2x}{2}$
- 15) Euler's Theorem $x \frac{\partial f}{\partial x} + y \frac{\partial f}{\partial y} = nf.$

Unit - II

Part - A

- 1) What is Differentiation?
- 2) What is maximum value?
- 3) Differentiate $\sqrt{2x} + 3^{2x}$.
- 4) If $y = 5 \tan x - 2 \log x$, find $\frac{dy}{dx} = ?$
- 5) Define Successive Differentiation.
- 6) If $y = 5x^3 + 9x^2$, find $\frac{dy}{dx} = ?$
- 7) Show that the function $y = x^3 - 3x^2 + 5$ has a maximum value at $x=0$, and minimum value at $x=2$.
- 8) Find $\frac{dy}{dx}$, when $y = x^3 + 5x^2 - 11x + 4$
- 9) $D(4x^2 - 16x) = ?$
- 10) If $y = e^{5x} - 2 \cos 3x$, find $y' = ?$

Part - B

- 1) Explain the rules of differentiation.
- 2) Discuss the applications of the differentiation in business.
- 3) i) If $y = \frac{e^x}{x^2}$, find $\frac{dy}{dx} = ?$
ii) Define Maxima and Minima of the function.
- 4) If $y = \log [\sqrt{x-a} + \sqrt{x-b}]$, find $\frac{dy}{dx} = ?$
- 5) Find the maximum and minimum values of the function. $f(x) = \frac{x}{(x-1)(x-4)}$, $1 < x < 4$

If $y = (3x^2 + 4x - 5)^3$, find $\frac{dy}{dx} = ?$

7) Explain the division rule for differentiation.

8) If, $x^y = e^{2-y}$, Prove That, $\frac{dy}{dx} = \frac{\log x}{[\log e^x]^2}$

9) i) If $x^3 - 8xy + 3y^2 = 14$ find $\frac{dy}{dx} = ?$

ii) If $y = \left(\frac{x-2}{x}\right)^3$ find $\frac{dy}{dx} = ?$

10) Find y' for $y = \frac{\log x}{x^2}$

11) Find the minimum value of the function,
 $f = 5 + 2x^2 - x^3$

PART C

1) If $y = \sin^{-1} \left[\frac{a+b \sin x}{b+a \sin x} \right]$, find $\frac{dy}{dx} = ?$

2) If $y = \frac{x^2 + 3x + 5}{x^2 + 2}$, find $\frac{dy}{dx} = ?$

3) Examine for maxima and minima of the function, $f(x) = x^4 - 8x^3 + 22x^2 - 24x + 8$

4) i) Find $\frac{dy}{dx}$, if $y = (2x+3)(3x-5)$

ii) Find $\frac{dy}{dx}$, if $y = \frac{x-2}{(x+3)^2}$

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5) Find $\frac{dy}{dx}$, if i) $y = \frac{x^2 + 2x + 3}{\sqrt{x}}$

ii) $y = \log \left[\frac{x^2 + 1}{x^2 - 1} \right]$