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Course code	: CSI-317

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Answer to the Question No - 1

① $y = e^{3x+2}$

$y_1 = \frac{dy}{dx} = e^{3x+2} \frac{d}{dx}(3x+2)$

$= e^{3x+2} (3.1+0)$

$= 3e^{3x+2}$

$y_2 = \frac{d^2y}{dx^2} = 3\left[\frac{d}{dx}(e^{3x+2})\right]$

$= 3[3e^{3x+2}]$

$= 9e^{3x+2}$

$= 9y$ (Ans.)

② $y = \log x + ax$

$\frac{dy}{dx} = \frac{1}{x} + a$

$\therefore y_1 = \frac{1}{x} + a$

$\frac{d^2y}{dx^2} = \frac{d}{dx}\left(\frac{1}{x} + a\right)$

$= \frac{-1}{x^2}$

$y_2 = -\frac{1}{x^2}$ (Ans).

(2)

Answer to the Question No - 2

$$f(x) = 3x^2 - 2x + 4$$

$$f'(x) = \frac{d}{dx}(3x^2) - \frac{d}{dx}(2x) + \frac{d}{dx}4$$

$$= 3x^2 - 2$$

at, $x = 0$ slope

$$m = f'(0) = 3.0^2 - 2$$

$$= -2$$

$$f(0) = 3.0^2 - 2.0 + 4$$

So the point is $(0, 4)$

So the equation is

$$y - y_0 = m(x - x_0) \qquad \begin{bmatrix} m = -2 \\ x = 0 \\ y = 4 \end{bmatrix}$$

$$y - 4 = -2(x - 0)$$

$$\Rightarrow y = -2x - 4$$

Answer to the Question No-4

$y = x^2 - 2x + 3$

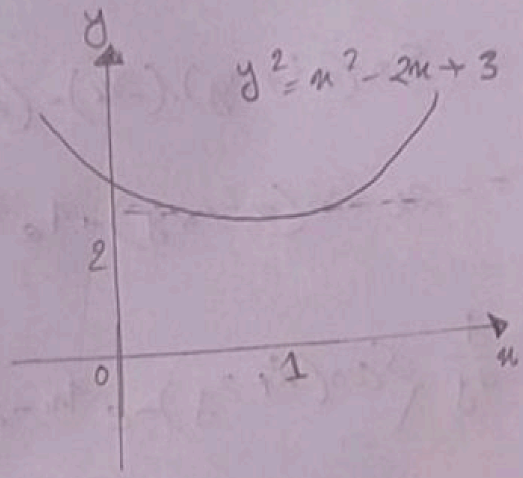
$\Rightarrow \frac{dx}{dx} = 2x - 2$

Now,

$2x - 2 = 0$

$\Rightarrow 2x = 2$

$x = 1.$



put $x = 1$ of y

$y = 1^2 - 2.1 + 3$

$= 1 - 2 + 3$

$= 2$

$\therefore (x, y) = (1, 2)$ (Ans.)

④

Answer to the Question no - 5

$$w = \cos(x^2+2y) - e^{4x - z^4 y} + 3$$

$$\frac{\partial w}{\partial x} = \frac{d}{dx}\left\{\cos(x^2+2y) - e^{4x-z^4y} + y^3\right\}$$

$$= -\sin(x^2+2y).(2x) - (e^{4x-z^4y}).4$$

$$= -2x\sin(x^2+2y) - 4e^{4x + z^4 y}$$

$$\frac{\partial w}{dy} = \frac{d}{dy}\left\{\cos(x^2+2y) - e^{4x-z^4y} + y^3\right\}$$

$$= -\sin(x^2+2y).2 + 3y^2$$

$$= -2\sin(x^2+2y) + 3y^2$$

$$\frac{\partial w}{\partial z} = -4z^3y\ e^{(4x-z^4y)}$$