

**Comprehensive Test Series-01**  
(Application of Derivatives)

**XII**

**TIME: 30 min**

**MM: 25**

**General Instructions:**

- All Questions are compulsory.
  - Use of calculator is not permitted.
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Q.1 Find the equation of all lines having slope 2 and being tangent to the curve

$$y + \frac{2}{x-3} = 0.$$

Q.2 Find point on the curve  $\frac{x^2}{4} + \frac{y^2}{25} = 1$  at which the tangents are (i) parallel to x-axis (ii) parallel to y-axis.

Q.3 Find the point on the curve  $y = (x - 2)^2$  at which the tangent is parallel to the chord joining the points (2, 0) and (4, 4).

Q.4 For the curve  $y = 4x^3 - 2x^5$ , Find all the points at which the tangent passes through the origin.

Q.5 Find the point on the curve  $x^2 + y^2 - 2x - 3 = 0$  at which the tangents are parallel to the x-axis.

Q.6 Find the equation of the normal at the point  $(am^2, am^3)$  for the curve  $ay^2 = x^3$ .

Q.7 Prove that the curves  $x = y^2$  and  $xy = k$  cut at right angles if  $8k^2 = 1$ .

Q.8 Find the equations of the tangent and normal to the hyperbola  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$  at the point  $(x_0, y_0)$ .