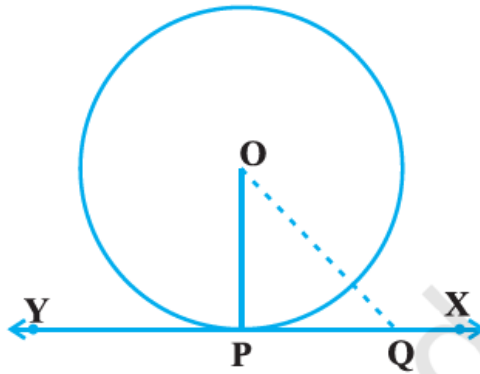


## THEOREMS BASED ON CIRCLES (CLASS – X )

**Theorem 10.1 :** *The tangent at any point of a circle is perpendicular to the radius through the point of contact.*



**Given:** A circle with centre O and a tangent XY to the circle at a point P.

**To Prove:** OP is perpendicular to XY.

**Construction:** Take a point Q on XY other than P and join OQ.

**Proof :** The point Q must lie outside the circle since if Q lies inside the circle, XY will become a secant and not a tangent to the circle.

Therefore, OQ is longer than the radius OP of the circle.

i.e.  $OQ > OP$ .

Since this happens for every point on the line XY except the point P, OP is the shortest of all the distances of the point O to the points of XY.

So OP is perpendicular to XY.