EDUCATION DEPARTMENT, VILLUPURAM DISTRICT.

Class : **X**	**UNIT TEST**	Marks: 50
Subject: **Mathematics**	**UNIT 4 - Geometry**	Time: 1½ hrs.

I **Choose the correct answer.** 7×1=7

1. In ∆LMN, ∠L = 60°, ∠M = 50°. If ∆LMN ~ ∆PQR then the value of ∠R is
   a) 40° b) 70° c) 30° d) 110°

2. If ∆ABC is an isosceles triangle with ∠C = 90° and AC = 5 cm, then AB is
   a) 2.5 cm b) 5 cm c) 10 cm d) $5\sqrt{2}$ cm

3. The perimeters of two similar triangles ∆ABC and ∆PQR are 36 cm and 24 cm respectively. If PQ = 10 cm, then the length of AB is

   a) $6\dfrac{2}{3}$ cm b) $\dfrac{10\sqrt{6}}{3}$ cm c) $66\dfrac{2}{3}$ cm d) 15 cm

4. In a ∆ABC, AD is the bisector of ∠BAC. If AB = 8 cm, BD = 6 cm and DC = 3 cm. The length of the side AC is
   a) 6 cm b) 4 cm c) 3 cm d) 8 cm

5. In the adjacent figure ∠BAC = 90° and AD ⊥ BC then
   a) BD . CD = BC^2 b) AB . AC = BC^2
   c) BD . CD = AD^2 d) AB . AC = AD^2

6. How many tangents can be drawn to the circle from an exterior point?
   a) one b) two c) infinite d) zero

7. In figure if PR is tangent to the circle at P and O is the centre of the circle, then ∠POQ is
   a) 120° b) 100°
   c) 110° d) 90°
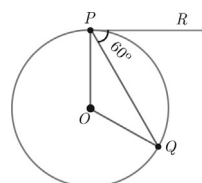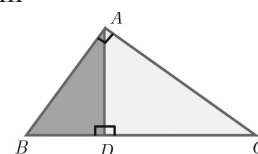
II **Answer the following questions. (any 5)** 5×2=10

1. Is ∆ABC ~ ∆PQR?
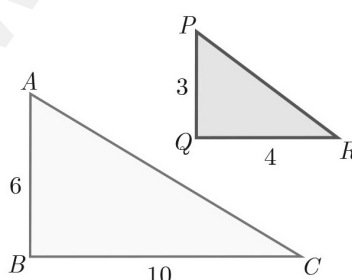
2. D and E are respectively the points on the sides AB and AC of a ∆ABC such that AB = 5.6 cm, AD = 1.4 cm, AC = 7.2 cm and AE = 1.8 cm, show that DE ‖ BC.

3. An insect 8 m away initially from the foot of a lamp post which is 6 m tall, crawls towards it moving through a distance. If its distance from the top of the lamp post is equal to the distance it has moved, how far is the insect away from the foot of the lamp post?

4. Check whether AD is bisector of ∠A of ∆ABC in of the following:
   AB= 4 cm, AC = 6 cm, BD = 1.6 cm and CD= 2.4 cm.

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5. What length of ladder is needed to reach a height of 7 ft along the wall when the base of the ladder is 4 ft from the wall? Round off your answer to the next tenth place.

6. The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?

7. A tangent ST to a circle touches it at B. AB is a chord such that $\angle$ABT = 65°. Find $\angle$AOB, where "O" is the centre of the circle.

III Answer the following questions. (any 5)   **5×5=25**

1. State and Prove Angle Bisector Theorem.

2. In $\triangle$ABC, D and E are points on the sides AB and AC respectively such that DE || BC
    If AD = $8x - 7$, DB = $5x - 3$, AE = $4x - 3$ and EC = $3x - 1$, find the value of x.

3. In trapezium ABCD, AB || DC, E and F are points on non-parallel sides AD and BC respectively,
    such that EF || AB. Show that $\dfrac{AE}{ED} = \dfrac{BF}{FC}$

4. The perpendicular PS on the base QR of a $\triangle$PQR intersects QR at S, such that QS = 3 SR.
    Prove that $2PQ^2 = 2PR^2 + QR^2$

5. PQ is a chord of length 8 cm to a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length of the tangent TP.

6. Show that in a triangle, the medians are concurrent.

7. P and Q are the mid-points of the sides CA and CB respectively of a $\triangle$ABC, right angled at C. Prove that $4(AQ^2 + BP^2) = 5AB^2$.

IV Answer the following question.   **1×8=8**

1. a)   Construct a triangle $\triangle$PQR such that QR = 5 cm, $\angle$P = 30° and the altitude from P to QR is of length 4.2 cm.

(OR)

   b)   Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.

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