Pre Board MT -03

INFINITY THINK BEYOND.....
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**Syllabus: Mock Test 03 : Ch – Similar Triangles , Circles and Coordinate Geometry**

**Time: 90 min** **Maximum marks :40**

## INSTRUCTIONS TO THE STUDENTS

1 . Read each question carefully .
2. Mark of each question is mention in front of question .
3. Attempt one question in internal choice based question .
4. Use of calculators is not allowed.
5. No negative marking .

## SECTION A

**( Questions 1 – 10 carry 1 marks )**

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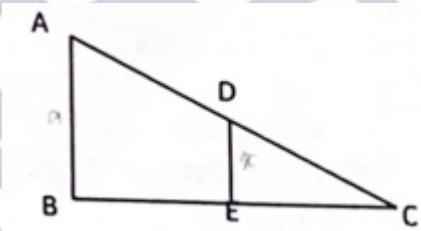
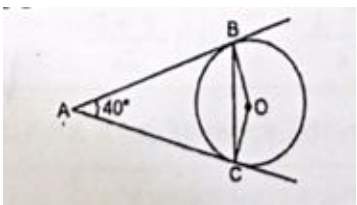
|---|---|---|
| **1** | In the figure , ABC is a triangle which DE ‖ Ab. If AB =a , DE = x BE =b and EC = c , then express x in terms of a , and c<br>  <br><br>(a) x = $\frac{ac}{b}$ (b) x = $\frac{ac}{b+c}$ (c) x = $\frac{ab}{c}$ (d) x = $\frac{ab}{b+c}$ | **1** |
| **2** | In △ ABC ~ △PQR , AB = 8cm , PQ = 6 cm and the perimeter of △ABC is 36 cm , then the perimeter of △PQR is<br>(a)27cm (b)48 cm (c)64cm (d)40cm | **1** |
| **3** | The ratio in which x axis divides the line segment joining (-2,3) and (6,-7) is<br>(a)1:3 (b) 3:7 (c) 7:3 (d) 1:2 | **1** |
| **4** | The point on the x- axis nearest to point (5,-12) is:<br>(a)(5,0) (b) (0,0) (c) (-5,0) (d) (5,-5) | **1** |
| **5** | In a circle of radius 7cm tangent PT is drawn from a point P such that PT = 24cm . If O is the centre of the circle , then the length of OP is<br>(a)25 cm (b) 28cm (c) 30 cm (d) 31cm | **1** |
| **6** | From an external point Q , the length of the tangent to a circle is 5cm and the distance of Q from the centre is 8cm . The radius of the circle is<br>(a)39cm (b)3cm (c)7 cm (d) $\sqrt{39}$ cm | **1** |
| **7** | PQ is drawn parallel to the base BC of △ABC cutting AB at P and AC at Q. If AB = 4BP and QC = 2cm , then AC =<br>(a)2cm (b)4cm (c)6cm (d)8cm | **1** |
| **8** | In the given figure , AB and AC are the tangents to the circle with centre O such that $\angle BAC = 40^o$ then $\angle BOC =$<br>(a)40° (b)50°<br>(c)140° (d)150°<br>  <br> | **1** |

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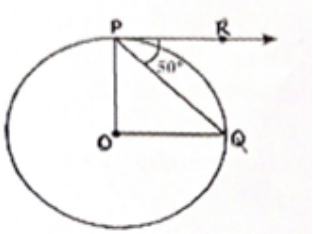
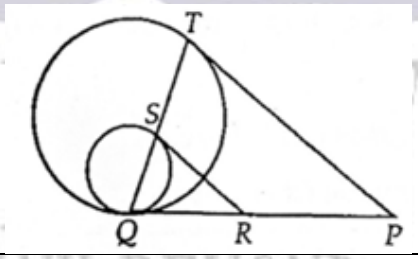
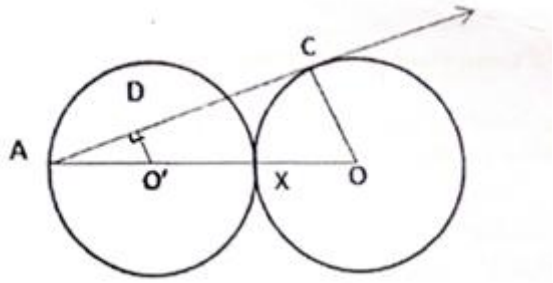
| **9** | In the fig, If O is a centre of the circle , PQ is a chord and tangent at P makes the angle of 50° with PQ then ∠POQ =<br>  <br><br>(a)100° (b) 80 ° (c) 90° (d) 75° | **1** |
| **10** | Direction: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:<br>(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).<br>(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).<br>(c) Assertion (A) is true but Reason (R) is false.<br>(d) Assertion (A) is false but Reason (R) is true.<br>**Assertion (A):**ABCD is a trapezium with DC ∥ AB , E and F are points on AD and BC respectively, such that EF ∥ AB , then $\frac{AE}{ED} = \frac{BF}{FC}$<br>**Reason(R):**An line parllel to parllel sides of a trapezium divides the non- parllel sides proportionally | **1** |
| | **SECTION B**<br>**( Questions 11 – 13 carry 2 marks )** | |
| **11** | In the given , PQ is the common tangent to both the circle SR and PT are tangents . If SR = 4cm , PT = 7cm , then find RP<br>  <br> | **2** |
| **12** | The line segment joining the points (3,-4) and (1,2) is trisected at the points P and Q . If the coordinates of P and Q are (p, -2) and ( $\frac{5}{3}$ , q) respectively , find the value of p and q | **2** |
| **13** | (a)From an external point P , tangents PA and PB are drawn to a circle with centre O If ∠PAB = 50° , then find ∠AOB<br>**OR**<br>(b) Prove that the length of the tangents drawn from an external point to a circle are equal | **2** |
| | **SECTION C**<br>**( Questions 14 – 15 carry 3 marks )** | |
| **14** | In the figure, two equal circles with centre O and O' , touch each other at X . O'X produced meets the circle with centre O' at A . AC is tangent to the circle with centre O, at the point C . O'D is perpendicular to AC . Find the value of $\frac{DO'}{CO}$<br>  <br><br>**OR** | **3** |

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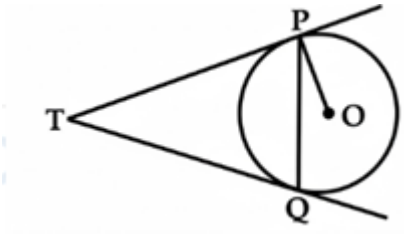
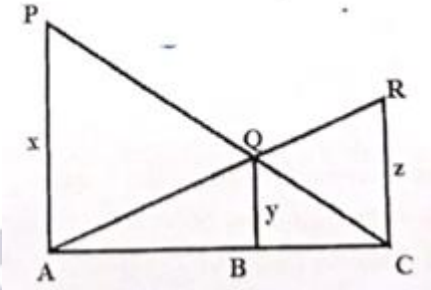
| | Two tangent TP and TQ are drawn to a circle with centre O from an external point T . Prove that ∠PTQ = 2∠OPQ   | |
| **15** | In the given figure, PA , QB and RC are each perpendicular to AC . If AP =x , BQ =y and CR =z , then prove that $\frac{1}{x}+\frac{1}{z}=\frac{1}{y}$   | **3** |

## SECTION D

**( Questions 16 – 17 carry 5 marks )**

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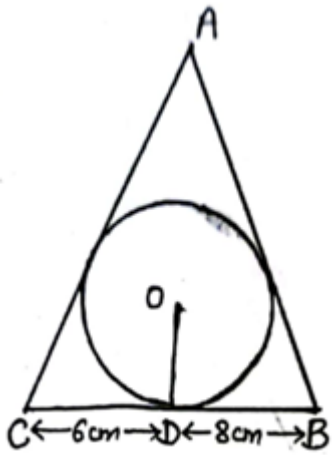
| **16** | (a)Prove Basic Proportionality theorem<br>**OR**<br>(b)Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of △PQR . Prove that △ABC ~ △PQR. | **5** |
| **17** | A triangle ABC is drawn to circumscribe a circle of radius 4cm . The side BC is divided by the point of contact D into BD and DC of length 8cm and 6tcm respectively. Find the sides AB and AC   | **5** |

## SECTION E

**( Questions 18 – 19 carry 4 marks )**

| | | |
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| **18** | Rohit and Mohit built robot that can paint a path as its moves on a graph paper . Some coordinates of points are marked on it It starts from (0,0)d moves to the pints listed in order (in straight lines) and ends at (0,0)<br>Arushi entered the pints P(8,6) , Q (12,2) and S (-6,6) in order . The path drawn by root is shown in the figure . | **4** |

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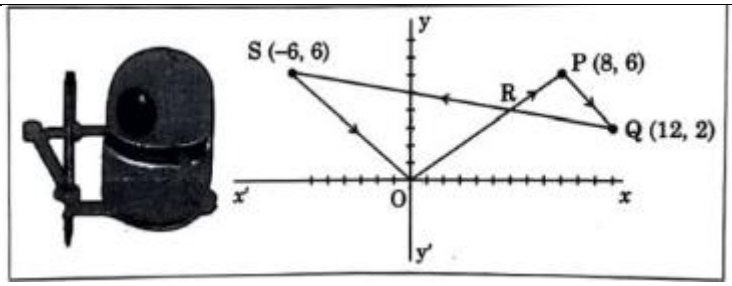
| |  <br>Based on the above , answer the following questions:<br>(i)Determine the distance OP.<br>(ii)QS is respectively by equation 2x+9y =42. Find the coordinates of the point where it intersects y-axis.<br>(iii)(a)Point R(2,8.y) divides the line segment OP in a certain ratio, find the ratio. Hence find the value of y<br>**OR**<br>(b)Using distance formula , show that $\frac{PQ}{QS} = \frac{2}{3}$ | |
| **19** | Drones are used by military for survillance purpose. These days, drones are also used by individual entrepreeurs , SMEs and large companies to accomplish various other tasks . A drone is flying over a rectangular field with vertices at A(-100,0) B(100, 0) C (100, 150 ) ,and D (x,y) . The drone captures a imange at a loication (a,b).<br>Based on the above information , answer the following question:<br>(i)Find the coordinates of vertex D of the rectangular field<br>(ii)Find the distance between ponits A and C<br>(iii)(a)If a drone captures the image of an object P(a,b) on the rectangular field , find the relation betrween a nad b such that PA=PC.<br>**OR**<br>(b)If a drone captures the image of an object at a point Q which divides the line segment AD in the ratio 1:2 , find the coordinates of Q | **4** |