

## CBSE MIXED TEST PAPER-04

SECOND UNIT TEST, 2007-08

CLASS - X MATHEMATICS

[Time: 1.5 hrs.]

[M. M.: 40]

### General Instructions:

- (1) All questions are compulsory.
- (2) This questions paper is divided into four sections. Section A has 5 questions of 1 mark each, Section B has 4 questions of 2 marks each and Section C has 4 questions of 3 marks each and Section D has 3 questions of 5 marks each.
- (3) Internal choice are given in 2 question of Section B, 2 question of Section C and 1 question D. in such question do one part only.
- (4) Draw neat diagrams in answer wherever required.

### SECTION - A

- Q1. The 5<sup>th</sup> term of an A.P. exceeds its 7<sup>th</sup> term by 10. Find the common difference.
- Q2. What is the maximum and minimum value of  $\frac{1}{\cos \theta \sec \theta}$ ?
- Q3. Evaluate:  $7 \tan^2 \theta - 7 \sec^2 \theta$
- Q4. In  $\Delta ABC$ ,  $AB = 6\sqrt{3} \text{ cm}$ ,  $AC = 12 \text{ cm}$  and  $BC = 6 \text{ cm}$  then is the  $\Delta ABC$  right angled at B? Justify.
- Q5. The length of tangent from a point A at a distance of 15cm from the centre is 12cm. find the radius of the circle.

### SECTION - B

- Q6. In a flower bed there are 23 rose plants in the first row, 21 in the second, 19 in the third and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?
- Q7. Without using trigonometric table find the value of:

$$\frac{\sin 20^\circ}{\cos 70^\circ} + \tan(40^\circ + \theta) - \cot(50^\circ - \theta)$$

OR

if  $\cot A = \frac{4}{3}$  And  $A + B = 90^\circ$  then find the value of  $\tan B$ .

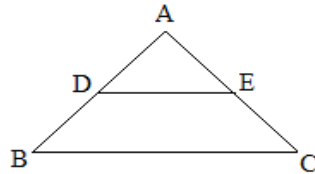
Q8. Evaluate:

$$\frac{\sin 60^\circ}{\cos^2 45^\circ} - \cot 30^\circ + 5 \cos 90^\circ$$

**OR**

if  $\tan A = \frac{1}{2}$  and  $\tan B = \frac{1}{3}$  Then find the value of  $(A + B)$  when  $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$  and  $(A + B)$  is acute.

Q9. In fig.  $\frac{AD}{DB} = \frac{3}{5}$ ,  $DE \parallel BC$  then find AE when  $AC = 12$ cm.



### SECTION - C

Q10. Find the of all three digit numbers which leave the remainder 3 when divided by 5.

Q11. Prove that:

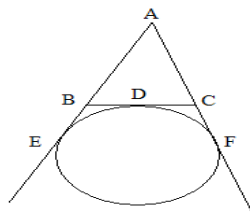
$$2\sec^2 \theta - \sec^4 \theta - 2\operatorname{cosec}^2 \theta + \operatorname{cosec}^4 \theta = \cot^4 \theta - \tan^4 \theta$$

**OR**

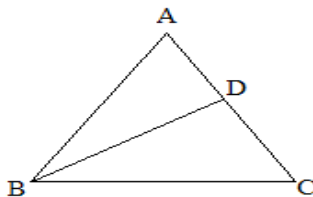
$$\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = \tan \theta + \cot \theta + 1$$

Q12. The ex circle of  $\Delta ABC$  touches the sides  $BC$ ,  $Ac$  produced,  $AB$  produced at  $D$ ,  $E$  and  $F$  as shown in the fig. shown in the fig. then show that:

$$AE = \frac{1}{2} (\text{Pr } \Delta \text{ of } ABC)$$

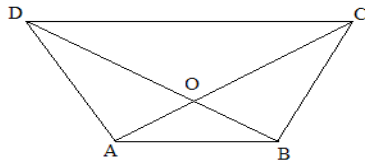


Q13. In fig.  $AB = AC$ ,  $D$  is any point on  $AC$  such that  $BC^2 = AC \cdot CD$  then prove that  $BD = BC$ .



OR

In the fig.  $\frac{AO}{OC} = \frac{BO}{OD} = \frac{1}{2}$ , Find AB when CD = 12cm.

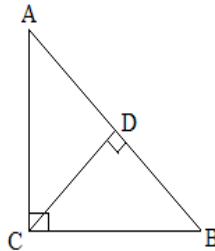


**SECTION - D**

Q14. State and prove the Pythagoras theorem.

In right  $\triangle ACB$ , if  $CD \perp AB$  and  $AB = c$ ,  $BC = a$ ,  $CA = b$  and  $CD = p$ ,

Then show that:  $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$



Q15. A man on the top of a vertical tower observes a car moving with a uniform speed coming directly towards it. If it takes 12 minutes for the angles of depression to change from  $30^\circ$  to  $45^\circ$  how soon will the car reach the tower?

OR

A tree breaks due to a storm and the broken part bends so that the top of the tree touches the ground making an angle of  $30^\circ$  with it. The distance between the feet of the tree to the point where the top touches the ground is 9m? Find the height of the tree.

Q16. Prove that the ratios of the areas of two similar triangles is equal to the ratios of the squares of their corresponding sides.

D and E are the mid points of the sides AB and AC respectively of  $\triangle ABC$ . If  $\text{ar}(\triangle ABC) = 56\text{cm}^2$  then find the  $\text{ar}(\triangle ADE)$ .

