

# SUMMATIVE ASSESSMENT-1

TIME: 3 hrs.

Class-10 : Mathematics

Max.Marks=90  
Total No. Pages: 06

## GENERAL INSTRUCTIONS

- (i) *All questions are compulsory.*
- (ii) *The question paper consists of 34 questions divided into four sections A,B,C and D. Section A comprises of 8 questions of 1 mark each, Section B comprises of 6 questions of 2 marks each, Section C comprises of 10 questions of 3 marks each and Section D comprises of 10 questions of 4 marks each.*
- (iii) *Question numbers 1 to 8 in Section A are multiple choice questions where you are to select the correct option out of the given four.*
- (iv) *There is no overall choice. However, internal choice has been provided in 1 question of two marks each, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternatives in all such questions.*
- (v) *Use of calculators is not permitted.*

## SECTION - A

(Question numbers 1 to 8 carry 1 mark each. For each question, four alternative choices have been provided of which one is correct. You have to select the correct choice.)

1. After how many places of decimal will the decimal expansion of

$$\frac{14}{1250} \text{ terminate ?}$$

- (A) 1 (B) 2 (C) 3 (D) 4

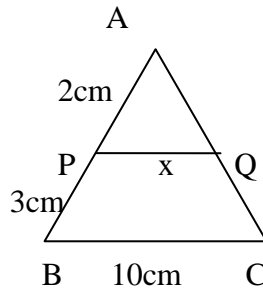
2. Prime factorisation of the denominator of the rational number whose decimal expansion is 1.234 is :

- (A)  $2^m \times 5^n$  where m and n are rational numbers
- (B)  $2^m \times 5^n$  where m and n are whole numbers
- (C)  $2^m \times 5^n$  where m and n are integers
- (D)  $2^m \times 5^n$  where m and n are real numbers

3. The number of zeroes the quadratic polynomial  $p(x) = 3x^2 + 12$  has is:

- (A) 0 (B) 1 (C) 2 (D) 3

4. In the given figure  $PQ \parallel BC$ , then  $x$  equals :



- (A) 2cm (B) 3cm (C) 4cm (D) 5cm

5. The maximum value for the sine of an angle is :

- (A) 0 (B) 1 (C)  $\sqrt{3}$  (D) Not Defined

6. If  $\tan \theta + \frac{1}{\tan \theta} = 2$ , then the value of  $\tan^2 \theta + \frac{1}{\tan^2 \theta}$  is :

- (A) 4 (B) 3 (C) 2 (D) 1

7. If  $\operatorname{cosec} \theta = 2$ , then  $\theta$  is :

- (A)  $90^\circ$  (B)  $60^\circ$  (C)  $45^\circ$  (D)  $30^\circ$

8. The  $x$ -coordinate of the point of intersection of the less than ogive and the greater than or equal to ogive gives :

- (A) Median (B) Mean (C) Mode (D) All averages

### **SECTION - B**

**(Question numbers 9 to 14 carry 2 marks each)**

9. Prove that  $5 + 2\sqrt{3}$  is irrational.

10. If the zeroes of the polynomial  $p(x) = 2x^2 - 5x + (k - 2)$  are the reciprocals of each other, then find the value of  $k$

OR

The sides of a rectangle ABCD in order are :

$$AB = 20\text{cm}, BC = 6\text{cm}, CD = (x + y)\text{cm}, DA = (x - y)\text{cm}$$

Find the values of  $x$  and  $y$

11. For what value of  $k$ , the pair of equations  $2x - 3y = 4, 6x - ky = 12$  has infinite number of solutions.

12. Prove that the diagonals of a trapezium divide each other proportionally.
13. If  $\sec 4A = \operatorname{cosec}(A - 20^\circ)$  where  $4A$  is an acute angle, find the value of  $A$ .
14. The median and mean of a data are respectively Rs 151 and Rs 152. Find the mode.

**SECTION - C**

**(Question numbers 15 to 24 carry 3 marks each)**

15. Use Euclid's division lemma to show that the square of any positive integers is either of the form  $3m$  or  $3m+1$  for some integer  $m$ .
16. Ritu can row downstream 20 km in 2 hours and upstream 4 km in 2 hours. Find the speed of her rowing in still water and the speed of the current.

OR

In an entrance test, one mark is awarded for each correct answer while  $\frac{1}{2}$  mark is deducted for each wrong answer. Gayatri answered 120 questions and got 90 marks. How many questions did she answer correctly ?

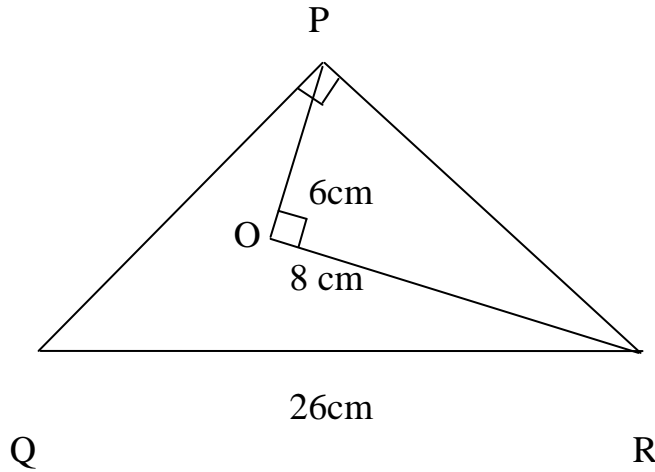
17. Check whether the pair of equations  $x + 3y = 6$  and  $2x - 3y = 12$  is consistent. If so, solve them graphically.
18. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

OR

Two isosceles triangles have equal vertical angles and their areas are in the ratio 36:49. Find the ratio of their corresponding medians.

19. Calculate the area of  $\triangle PQR$  where  $OP=6\text{cm}$ ,  $OR=8\text{cm}$ ,  $QR=26\text{cm}$ .

Also  $\angle QPR = \angle POR = 90^\circ$



20. If  $\sec \theta + \tan \theta = p$ , prove that  $\sin \theta = \frac{p^2 - 1}{p^2 + 1}$ .

OR

Evaluate :  $\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$ .

21. If  $A, B, C$  are the interior angles of a triangle  $ABC$ , then show that

$$\sin\left(\frac{B+C}{2}\right) = \cos \frac{A}{2}$$

22. Prove that :  $\frac{1}{\sec \theta - \tan \theta} - \frac{1}{\cos \theta} = \frac{1}{\cos \theta} - \frac{1}{\sec \theta + \tan \theta}$ .

23. The following distribution shows the daily pocket allowance of children of locality. The mean pocket allowance is Rs 18. Find the missing frequency  $f$  :

Daily pocket allowance (in Rs)	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Number of children	7	6	9	13	$f$	5	4

24. Find the mode of the following data.

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

### **SECTION - D**

**(Question numbers 25 to 34 carry 4 marks each)**

25. The floor of a room is in the shape of a rectangle of length 9.6m and breadth 4.2m. Find the measure of the side of the largest square shaped tile that can be used in the whole to cover the floor completely. How many such tiles are needed for the purpose ?
26. The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. Prove it.

OR

Prove that in a right triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides.

27. If  $7\sin^2\theta + 3\cos^2\theta = 4$ , then prove that  $\operatorname{cosec}\theta + \sec\theta = 2 + \frac{2}{\sqrt{3}}$ .

28. If  $\tan\theta + \sin\theta = m$ ,  $\tan\theta - \sin\theta = n$  then prove that  $m^2 - n^2 = 4\sqrt{mn}$ .

OR

Prove that :  $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$ .

29. In an equilateral triangle  $ABC$ ,  $D$  is a point on the side  $BC$  such that  $BD = \frac{1}{3}BC$ . Prove that  $9AD^2 = 7AB^2$ .

30. Find all the zeros of  $2x^4 - 3x^3 - 3x^2 + 6x - 2$ , if you know that two of its zeroes are  $\sqrt{2}$  and  $-\sqrt{2}$ .

31. Places A and B are 100km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars.?

32. 2 men and 7 boys can do a piece of work in 4 days. The same work is done in 3 days by 4 men and 4 boys. Find the number of days taken by 1 man and 1 boy alone to finish the work separately.

33. The following table gives the production yield per hectare of wheat of 100 farms of a village. Change the distribution to a more than or equal type distribution and draw its ogive.

Production Yield (in kg/ha)	50-55	55-60	60-65	65-70	70-75	75-80
Number of farms	2	8	12	24	38	16

34. A survey regarding the heights (in cm) of 51 girls of Class X of a school was conducted and the following data was obtained.

Height (in cm)	Number of girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

Find the median height.