

SUMMATIVE ASSESSMENT-1

Class –X

DURATION: 3- 3 ½ hrs

MATHEMATICS

MAX MARKS:90

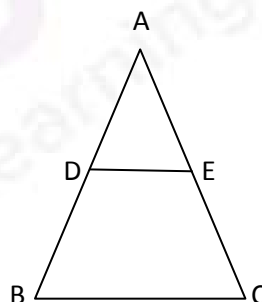
GENERAL INSTRUCTIONS:

- 1.All questions are compulsory.
- 2.The question paper consists of 34 questions divided to four sections A,B,C,D .section A comprises of 8 questions of 1 mark each, section B comprises of 6 questions of 2marks each , section C comprises of 10 questions of 3marks each, section D comprises of 10 questions of 4marks each .
3. section A comprises of multiple choice questions where you have to select one correct option.

SECTION –A

Question numbers 1 to 8 carry 1 mark each

1. If n is a natural number then 4^n will never end with the digit
a)4 b)6 c)0 d)none
2. If a zero of the polynomial x^2+3x+k is 2 then the value of k is
a) 5 b) –5 c) 10 d) -10
3. If $AD=2\text{cm}, DE=4\text{cm}, BD=3\text{cm}$ and $DE \parallel BC$ Find BC.



- a) 6 b) 8 c) 10 d) 12.5
4. If $2\cos^2\theta = \frac{1}{2}$, $0 < \theta < 90^\circ$ then $\theta =$
a) 30° b) 0° c) 60° d) 90°
5. $9\sec^2A - 9\tan^2A =$ -----
a) 0 b) 9 c) 1 d) -9
6. Which of the following is equal to $\sin 67^\circ + \cos 75^\circ$
a) $\cos 23^\circ - \sin 15^\circ$ b) $\cos 23^\circ + \sin 15^\circ$ c) $\cos^2 23^\circ - \sin^2 15^\circ$ d) $\cos 67^\circ - \sin 75^\circ$

7. For what value of θ , $\sin\theta = \cos\theta$

- a) 45° b) 0° c) 30° d) 90°

8. For a given data the less than ogive and more than ogive intersect at $(15.5, 20)$. Median of the data is

- a) 4.5 b) 20 c) 15 d) 15.5

SECTION B

Question number 9 to 14 carry 2 marks each

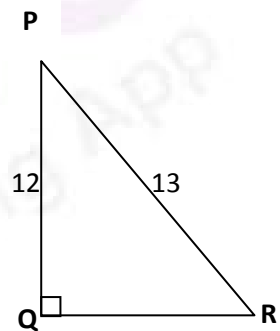
9 Use Euclids division algorithm to Find the H.C.F OF 870 AND 225.

10. Without division state which of the following will have a terminating decimal expansion

- a) $\frac{13}{3125}$ b) $\frac{77}{210}$

11. ABCD is a trapezium in which $AB \parallel DC$. Diagonals intersect at O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$

12. Find $\tan P - \cot R$



13. If $\tan A = \cot B$. Prove that $A + B = 90^\circ$

OR

If $\sec 4A = \operatorname{cosec}(A - 20^\circ)$ where $4A$ is a acute angle then find A .

14. Write a frequency distribution table for the given data.

MARKS	0 AND ABOVE	10 AND ABOVE	20 AND ABOVE	30 AND ABOVE	40 AND ABOVE	50 AND ABOVE
NO:OF STUDENTS	30	28	21	15	10	0

SECTION C

Question 15 to 24 carry 3 marks each

15. Show that one and only one of $n, n+2, n+4$ is divisible by 3.

OR

Show that the square of any positive integer is either of the form $3m$ or $3m+1$ for some integer m .

16. Prove that $5+3\sqrt{2}$ is an irrational number.

17. For what value of K the following equations have no solution.

$$3x+y=1$$

$$(2k-1)x+(k-1)y= 2k+1$$

18. Find the zeroes of $5x^2 - 4 - 8x$ and verify the relationship between zeroes and coefficients.

19. Evaluate

$$\tan^2 60^\circ + 4\sin^2 45^\circ + 3\sec^2 30^\circ + 5\cos^2 90^\circ$$

$$\operatorname{cosec} 30^\circ + \sec 60^\circ - \cot^2 30^\circ$$

OR

$$\frac{3\tan 35^\circ \tan 40^\circ \tan 50^\circ \tan 55^\circ - \frac{1}{2} \tan^2 60^\circ}{4(\cos^2 39^\circ + \cos^2 51^\circ)}$$

20. Find mean daily expenditure on food

DAILY EXPENDITURE (IN RS)	NO: OF HOUSEHOLDS
100-150	6
150-200	7
200-250	12
250-300	3
300-350	2

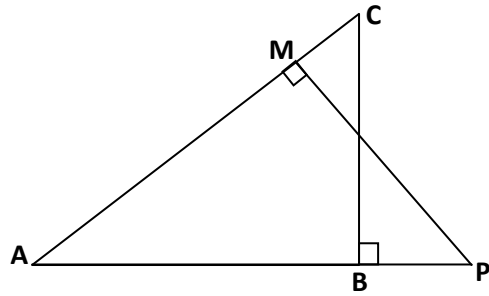
21. Find the mode of the data which gives information on observed lifetime of 225 electrical components.

LIFE TIME (hrs)	0-20	20-40	40-60	60-80	80-100	100-120
FREQUENCY	10	35	52	61	38	29

22. If the areas of two similar triangles are equal prove that they are congruent

23 . ABC and AMP are two right triangles right angled at B and M respectively. prove that

a) $\triangle ABC \sim \triangle AMP$ b) $\frac{CA}{PA} = \frac{BC}{MP}$



24. Prove that $\frac{1 + \cos A}{\sin A} + \frac{\sin A}{1 + \cos A} = 2 \operatorname{cosec} A$

SECTION D

Question 25 to 34 carry 4 marks each

25. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$ if two of its zeroes are $\sqrt{\frac{5}{3}}$, $-\sqrt{\frac{5}{3}}$

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

OR

In a triangle if the square of one side is equal to the sum of the squares of the other two sides then the angle opposite to the first side is a right angle , prove.

27. Prove that

$$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$$

28. $\sqrt{\frac{\sec A - 1}{\sec A + 1}} + \sqrt{\frac{\sec A + 1}{\sec A - 1}} = 2 \operatorname{cosec} A$

OR

Evaluate
$$\frac{\sec \theta \operatorname{cosec}(90-\theta) - \tan \theta \cot(90-\theta) + \sin^2 55^\circ + \sin^2 35^\circ}{\tan 10^\circ \tan 20^\circ \tan 60^\circ \tan 70^\circ \tan 80^\circ}$$

29 . Solve graphically $4x - 5y - 20 = 0$, $3x + 5y - 15 = 0$. Determine the vertices of the triangle formed by these lines and the y axis.

30. If the median of the distribution given below is 28.5, find the values of x and y.

CLASS INTERVAL	0-10	10-20	20-30	30-40	40-50	50-60	TOTAL
FREQUENCY	5	X	20	15	Y	5	60

31. Draw a less than type ogive and obtain the median from the graph

WEIGHT(in kg)	NO: OF STUDENTS
LESS THAN 38	0
LESS THAN 40	3
LESS THAN 42	5
LESS THAN 44	9
LESS THAN 46	14
LESS THAN 48	28
LESS THAN 50	32
LESS THAN 52	35

32. Solve

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

33. A person can row 8km upstream and 24km downstream in 4hrs. he can row 12km downstream and 12km upstream in 4hrs. Find speed of the person in still water and speed of current.

34. BL and CM are medians of a $\triangle ABC$ right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.

OR

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