

Sample Paper-1
Mathematics (X)
Summative Assessment -I

Time: 3 hours**Max. Marks 90****General Instructions**

1. All questions are compulsory.
 2. Draw neat labeled diagram wherever necessary to explain your answer.
 3. Q.No. 1 to 11 are of objective type questions, carrying 1 mark each.
 4. Q.No.12 to 20 are of short answer type questions, carrying 2 marks each.
 5. Q. No. 21 to 31 carry 3 marks each. Q. No. 32 to 38 carry 4 marks each.
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1. For some integer m , every even integer is of the form
(A) m (B) $m + 1$
(C) $2m$ (D) $2m + 1$
2. Given that two of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0, the third zero is
(A) $-b/a$ (B) b/a
(C) c/a (D) $-d/a$
3. It is given that $\Delta ABC \sim \Delta DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, the following is true:
(A) $DE = 12$ cm, $\angle F = 50^\circ$ (B) $DE = 12$ cm, $\angle F = 100^\circ$
(C) $EF = 12$ cm, $\angle D = 100^\circ$ (D) $EF = 12$ cm, $\angle D = 30^\circ$
4. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is
(A) 25 (B) 72
(C) 63 (D) 36
5. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1$ is -3 , then the value of k is
(A) $4/3$ (B) $-4/3$
(C) $2/3$ (D) $-2/3$
6. The value of $(\sin 30^\circ + \cos 30^\circ) - (\sin 60^\circ + \cos 60^\circ)$ is
(A) -1 (B) 0
(C) 1 (D) 2
7. For some integer q , every odd integer is of the form
(A) q (B) $q + 1$
(C) $2q$ (D) $2q + 1$

8. The pair of equations $5x - 15y = 8$ and $3x - 9y = 24$ has
(A) one solution (B) two solutions
(C) infinitely many solutions (D) no solution
9. The value of $(\sin 45^\circ + \cos 45^\circ)$ is
(A) $1/2$ (B) 2
(C) $3/2$ (D) 1
10. Construction of a cumulative frequency table is useful in determining the
(A) mean (B) median
(C) mode (D) all the above three measures
11. The abscissa of the point of intersection of the less than type and of the more than type cumulative frequency curves of a grouped data gives its
(A) mean (B) median
(C) mode (D) all the three above
12. Write whether every positive integer can be of the form $4q + 2$, where q is an integer. Justify your answer..
13. Justify your answer: Can $x^2 - 1$ be the quotient on division of $x^6 + 2x^3 + x - 1$ by a polynomial in x of degree 5?
14. Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not.
15. Prove that: $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \sec A \operatorname{cosec} A$
16. Is it true to say that if in two triangles, an angle of one triangle is equal to an angle of another triangle and two sides of one triangle are proportional to the two sides of the other triangle, then the triangles are similar? Give reasons for your answer.
17. Is the following statement true? Why?
“Two quadrilaterals are similar, if their corresponding angles are equal”.
18. Triangle with sides 25 cm, 5 cm and 24 cm a right triangle? Give reasons for your answer.
19. The median of an ungrouped data and the median calculated when the same data is grouped are always the same. Do you think that this is a correct statement? Give reason.

20. Is it true to say that the mean, mode and median of grouped data will always be different? Justify your answer.
21. Write the denominator of the rational number $\frac{257}{5000}$ in the form $2m \times 5n$, where m, n are non-negative integers. Hence, write its decimal expansion, without actual division.
22. Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and the coefficients of the polynomial: $4x^2 - 3x - 1$
23. Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not.
24. Prove that $\sqrt{p} + \sqrt{q}$ is irrational, where p, q are primes.
25. Show that: $(\tan \theta + 2)(2 \tan \theta + 1) = 5 \tan \theta + 2 \sec^2 \theta$
26. Show that: $\sqrt{(1 - \cos^2 \theta) \sec^2 \theta} = \tan \theta$
27. Diagonals of a trapezium PQRS intersect each other at the point O, $PQ \parallel RS$ and $PQ = 3 RS$. Find the ratio of the areas of triangles POQ and ROS.
28. Corresponding sides of two similar triangles are in the ratio of 2 : 3. If the area of the smaller triangle is 48 cm², find the area of the larger triangle.
29. Given below is a cumulative frequency distribution showing the marks secured by 50 students of a class

Marks	<20	<40	<60	<80	<100
No. of Students	17	22	29	37	50

Form the frequency distribution table for the data.

30. Find the mean of the distribution:

Class	1-3	3-5	5-7	7-10
Frequency	9	22	27	17

31. Given that the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form $a, a+b, a + 2b$ for some real numbers a and b , find the values of a and b as well as the zeroes of the given polynomial.
32. O is the point of intersection of the diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$. Through O, a line segment PQ is drawn parallel to AB meeting AD in P and BC in Q. Prove that $PO = QO$.

33. Prove that the area of the equilateral triangle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles drawn on the other two sides of the triangle.
34. Show that $(\sin \phi + \cos \phi)(\tan \phi + \cot \phi) = \sec \phi + \operatorname{cosec} \phi$
35. If $\tan \theta + \sec \theta = l$, then show that $\sec \theta = \frac{l^2 + 1}{2l}$
36. Susan invested certain amount of money in two schemes A and B, which offer interest at the rate of 8% per annum and 9% per annum, respectively. She received Rs 1860 as annual interest. However, had she interchanged the amount of investments in the two schemes, she would have received Rs 20 more as annual interest. How much money did she invest in each scheme?
37. Size of agricultural holdings in a survey of 200 families is given in the following table:

Size of agricultural holdings (in ha)	Number of families
0-5	10
5-10	15
10-15	30
15-20	80
20-25	40
25-30	20
30-35	5

Compute median and mode size of the holdings.

38. 50 students enter for a school javelin throw competition. The distance (in metres) thrown are recorded below:

Distance(in m)	0-20	20-40	40-60	60-80	80-100
Number of students	6	11	17	12	4

- Construct a cumulative frequency table.
- Draw a cumulative frequency curve (less than type) and calculate the median distance thrown by using this curve.
- Calculate the median distance by using the formula for median.
- Are the median distance calculated in (ii) and (iii) same?

