APEEJAY SCHOOL, PITAMPURA

SUMMATIVE ASSESSMENT-I

MATHEMATICS

CLASS-IX

Time allowed: 3 hours **Maximum Marks: 90**

General Instructions:

i) All questions are **compulsory.**

ii) The question paper consists of **31** questions divided into four sections A, B, C, and D. **Section – A** comprises of **4** 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 **11** questions of **4 marks** each.

iii) There is no overall choice.

iv) Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 4 carry one mark each. For each question , four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. A rational number between $\sqrt{2} and \sqrt{3}$ is

   (a) $\frac{\sqrt{2}+\sqrt{3}}{2}$ (b) $\frac{\sqrt{2}\times\sqrt{3}}{2}$ (c) 1.5 (d) 1.8

2. The value of the polynomial $5x - 4x^2 + 3$, when x = -1 is

   (a) -6 (b) 6 (c) 2 (d) -2

3. One of the zeroes of the polynomial $2x^2 + 7x - 4$ is

   (a) 2 (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) -2

4. The value of $249^2 - 248^2$ is

   (a) 1^2 (b) 477 (c) 487 (d) 497

SECTION - B

Question numbers 5 to 10 carry 2 marks each.

5. Simplify: $2^{\frac{2}{3}} \times 2^{\frac{1}{5}}$

6. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by $5 + 2x$.

7. Find the value of k , if x-1 is a factor of p(x) , where p(x)= $2x^2 + kx + \sqrt{2}$

8. If a point C lies between two points A and B such that AC = BC, then prove that AC = $\frac{1}{2}$ AB. Explain by drawing the figure.

9. Find the coordinates of the point

   i) Whose ordinate is - 4 and which lies on y-axis.

   ii) Whose abscissa is 5 and which lies on x-axis.

10. Plot the following points on the graph paper:

    A(1 , 3) , B(-3 , -1), C(1 ,- 4)

SECTION -C

Question numbers 11 to 20 carry 3 marks each.

11. Represent $\sqrt{2}$ on the number line.

12. Visualise 3.765 on the number line , using successive magnification.

13. Factorise : $x^3 – 3x^2 – 9x – 5$.

14. Factorise : $64a^3 – 27b^3 – 144a^2b + 108ab^2$.

15. Prove that angles opposite to equal sides of an isosceles triangle are equal.

16. State and prove angle sum property of a triangle.

17. In an isosceles triangle ABC, with AB = AC, the bisectors of $\angle$ B and $\angle$ C intersect each other at O. Join A to O. Show that : i) OB = OC ii) AO bisects $\angle$ A.

18. ABC is an isosceles triangle with AB = AC and BD and CE are its two medians. Show that BD = CE.

19. Line segment AB is parallel to another line-segment CD. AD and CB intersect at O. O is also the mid-point of AD. Show that i) $\Delta AOB \cong \Delta DOC$ ii) O is also the mid-point of BC.

20. Sides of a triangle are in the ratio of 12: 17 : 25 and its perimeter is 540cm. Find its area.

SECTION – D

Question numbers 21 to 31 carry 4 marks each.

21. Rationalise the denominator : $\frac{1}{\sqrt{7}-\sqrt{6}}$

22. If $a = 5 + 2\sqrt{6}$ and $b = \frac{1}{a}$, then what will be the value of $a^2 + b^2$?

23. Factorise : $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$.

24. Factorise : $8x^3 + y^3 + 27z^3 - 18xyz$.

25. Without actually calculating the cubes, find the value of $(28)^3 + (-15)^3 + (-13)^3$.

26. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

27. A triangle ABC is right angled at A. L is a point on BC such that AL is perpendicular to BC. Prove that $\angle BAL = \angle ACB$

28. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$ and $\angle B > \angle D$.

29. ABC is an isosceles triangle with AB = AC and AP is a perpendicular from A on BC. Show that $\angle B = \angle C$.

30. In quadrilateral ACBD , AC = AD and AB bisects $\angle A$. Show that $\Delta ABC \cong \Delta ABD$.

31. A triangular park ABC has sides 120m, 80m and 50m. A gardener has to put a fence all around it and also plant grass inside it .How much area does he need to plant the grass? Find the cost of fencing it with barbed wire at the rate of Rs.20 per metre leaving a space 3m wide for a gate on one side. Which value is depicted?