SUMMATIVE ASSESSMENT – I, 2015

MATHEMATICS Class – IX

Time Allowed: 3 hours Maximum Marks: 90

General Instructions:

1. All questions are compulsory.

2. 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.

3. There is no overall choice in this question paper. 4. Use of calculator is not permitted.

Section – A

Question numbers 1 to 4 in Sections-A one mark questions

1. If $\sqrt{2} = 1.414$, then find the value of $\frac{1}{1-\sqrt{2}}$

2. If $x^{51} + 51$ is divided by $x + 1$ then, find the remainder.

3. What is the degree of a zero polynomial?

4. What do you mean by ordinate of a point?

Section – B

Section-B comprises of 6 questions of 2 marks each

5. Is π a rational number ? Justify your answer.

6. Find the remainder when $p(x) = x^3 - 6x^2 + 2x - 4$ is divided by $q(x) = 1 - 2x$.

7. Two line segments AB and CD intersect each other at O such that AO = OB and CO = OD. Prove that AC = BD.

8 . Prove that every line segment has one and only one mid-point. Give Euclid's axiom which is used.

9. The perimeter of an equilateral triangle is 450 m. Find its area and altitude. (Use $\sqrt{3} = 1.73$)

10. Plot the points (3, - 5) and (- 3, 5) and join them.

Section – C

Question numbers 11 to 20 in Sections - C are three marks questions

11. Simplify the following $\sqrt[3]{a^4b}\ +\ \sqrt[3]{ab^4}$

12. Find the values of a and b if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = \mathrm{a} + \mathrm{b}\sqrt{3}$

13. If x = √2 - 1, find the value of $x^3 + \frac{1}{x^3}$

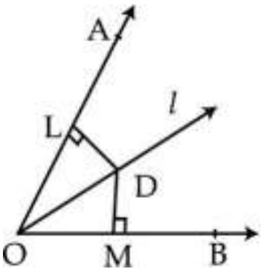
14. Simplify: $(2x + y - z)^2 - (2x + y + z)^2$

15. Factories : $x^4 - \frac{1}{64}$

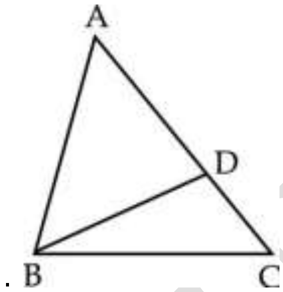
16. Prove that two lines which are respectively perpendicular to two other parallel lines are parallel to each other

17. In the figure, line *l* is the bisector of < AOB. D is a point on *l*. DL ⊥OA and DM ⊥ OB. Prove that

(i) Δ OMD ≅ Δ OLD (ii) DL = DM



18. In figure AC> AB and D is a point on AC such that AB = AD. Prove that CD < BC.



19. 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

20. Find the area of trapezium in which parallel sides are of lengths 5 cm and 11 cm whereas non-parallel sides are of lengths 4 cm and 6 cm.

Section – D

Question numbers 21 to 31 in Sections – D are four marks questions.

21. Given √ 2 = 1.4142 and √6 = 2.4495 . Find the value of $\frac{1}{\sqrt{3} - \sqrt{\sqrt{2}-1}}$ correct to three places of decimal.

22. if a = $\frac{1}{2+\sqrt{3}}$ and b = $\frac{1}{2-\sqrt{3}}$ then find $a^2 + b^2 - 14ab$.

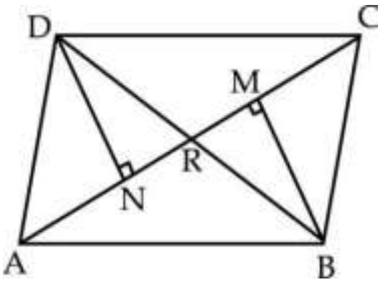
23. Find the quotient when $f(x) = x^3 + 3x^2 + 3x + 5$ is divided by $g(x) = x + 2$. Also, find the remainder

24. Without actually calculating the cubes, find the value of $(-1)^3 + (-2)^3 + (-3)^3 + (-4)^3 + 2(5)^3$. Also write the identity used.

25. Factorise : $9x^3 - 3x^2 - 5x - 1$

26. On Vanmahotsva day, students of class IX were asked to get saplings and develop nursery in the triangular region allotted to them. What value is being inculcated in them by doing so. AD is an altitude of an isosceles triangle ABC in which AB = AC. Prove that < BAD = < DAC.

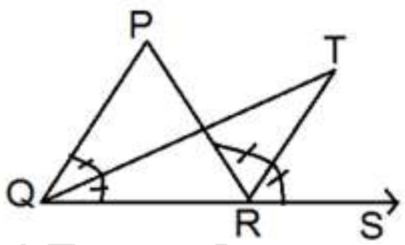
27. In figure, BM and DN are both perpendiculars to AC and BM = DN. Prove that AC bisects BD.



28. Show that in a triangle sum of any two sides of triangle is greater than twice the medians drawn to third side.

29. ABC is a triangle in which angle B = twice angle C. D is a point on side BC such that AD bisects angle A and AB= CD. Prove that Angle BAC=72^0

30. In Fig., the side QR of Δ PQR is produced to a point S. If the bisectors of ∠ PQR and ∠ PRS meet at point T, then prove that ∠ QTR = ½(∠ QPR)



31. In figure ABCD is a square and CDE is an equilateral triangle. Prove that (i) AE= BE (ii) < EBC = 15^0