SAMPLE PAPER FOR SUMMATIVE ASSESSMENT – I, 2015

Class – IX Sub - MATHEMATICS 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 carry one mark each

Q.1. Simplify : $3^{2/3} . 3^{1/5}$

Q.2. Find the degree of polynomial $x^9 - x^5 + 3x^{10} + 6$.

Q.3. The angles measure $(30 - a)°$ and $(125 + 2\ a)°$ of two angles are supplement of each other. Find the value of a.

Q.4. In which quadrants the points A $(-10, -10)$ and B $(-5, 1)$ lie ?

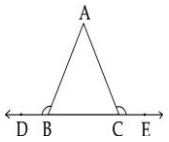
SECTION-B

Question numbers 5 to 10 carry two marks each.

Q.5. Insert three rational numbers between $\frac{1}{2}$ and 1.

Q.6. Factorise : $3x^2 + 10x + 3$

Q.7. In the figure, if $\angle ABD = \angle ACE$, then prove that $AB = AC$.



Q.8. Does Euclid's fifth postulate imply the existence of parallel lines ? Explain.

Q.9. If area of a right angled triangle is 240 m^2 and side other than hypotenuse is 30 m, find the perimeter of the triangle.

Q.10. Given a point X (4, 0), plot two points Y and Z on the graph paper so that XYZ is an isosceles triangle.

SECTION-C

Question numbers 11 to 20 carry three marks each.

Q.11. If $x = 2 + \sqrt{3}$, find $\left(x - \frac{1}{x}\right)^3$.

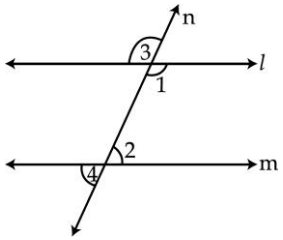
Q.12. If $2^x \left[\left(\frac{256}{81}\right)^x\right]^{1/4} = \frac{64}{9}$, find the value of x.

Q.13. Show that -1 and 4 are zeroes of the polynomial $x^3 - 13x - 12$. Also, find the third zero of the polynomial.

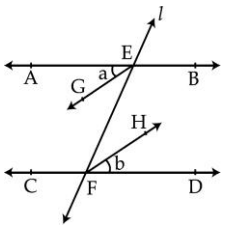
Q.14. If $x-3$ is a factor of $x^2-kx+12$, then find the value of k. Also, find the other factor of the polynomial for this value of k.

Q.15. In figure two sides AB and BC and median AM of ΔABC are respectively equal to sides DE and DF and the median DN of ΔDEF. Prove that $\Delta ABC \cong \Delta DEF$.

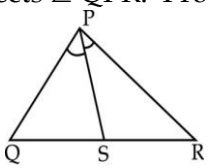
Q.16. In figure, if $l \| m$ and $\angle 1 = (x+30°)$, and $\angle 2 = (2x+15°)$, find $\angle 3$ and $\angle 4$.



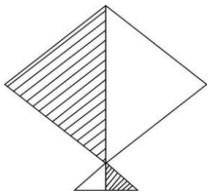
Q.17. In figure, a transversal l cuts two lines AB and CD at E and F respectively. EG is the bisector of $\angle AEF$ and FH is the bisector of $\angle EFD$ such that $\angle a = \angle b$. Show that $EG \| FH$ and $AB \| CD$.



Q.18. In figure PR > PQ and PS bisects $\angle$ QPR. Prove that $\angle$ PSR > $\angle$ PSQ.



Q.19. A kite is in the shape of a square with side 16 cm and an isosceles triangle of base 3 cm and equal sides of 6 cm each (see fig). It is made up of two colours as shown in the figure. Find the area of paper of each colour used in it. (Use $\sqrt{2} = 1.41$)



Q.20. A park is in the shape of a quadrilateral ABCD in which AB = 9 m, BC = 12 m, CD = 5 m, AD = 8 m and $\angle$ C = 90°. Find the area of the park.

SECTION-D

Question numbers **21** to **31** carry four marks each.

Q.21. Prove that : $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$.

Q.22. If $\frac{9^n \times 3^2 \times \left(3^{-n/2}\right)^{-2} - 27^n}{3^{3m} \times 2^3} = \frac{1}{27}$, prove that $m-n=1$.

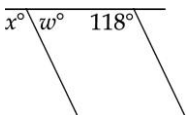
Q.23. Factorise : x^3-7x-6.

Q.24. Expand $\left(\frac{5}{2}x + 1\right)^3$.

Q.25. If the polynomials $(2x^3 + ax^2 + 3x - 5)$ and $(x^3 + x^2 - 2x + a)$ leave the same remainder when divided by $(x - 2)$, find the value of 'a'.

Q.26. Factorise : $a^9 - b^9$

Q.27. This figure represents line segments painted on a parking lot to create parking spaces.

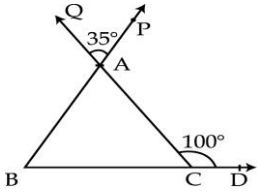


If these line segments are parallel find the value of *x* and *w*.

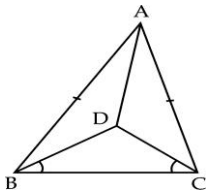
People in the colony are thinking to use car pool while going to their work place. What value are they showing by doing so ?

Q.28. Prove that two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle.

Q.29. Sides BC, CA and BA of a triangle ABC are produced to D, Q, P, respectively as shown in the figure. If $\angle ACD = 100°$, $\angle QAP = 35°$, find all the angles of the triangle.



Q.30. In figure, ABC is an isosceles triangle with AB = AC. D is a point in the interior of ΔABC such that $\angle CBD = \angle BCD$. Prove that AD bisects $\angle BAC$ of ΔABC.



Q.32. In figure ABCD is a square and CDE is an equilateral triangle. Prove that

(i) AE = BE (ii) $\angle EBC = 15°$