SUMMATIVE ASSESSMENT – I, 2014
MATHEMATICS
Class – IX

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

General Instructions:

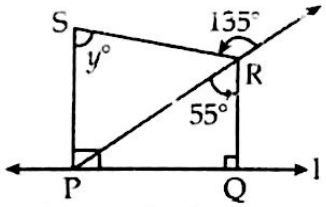
1. All questions are **compulsory**.
2. The question paper consists of 31 questions divided into four sections A, B, C and D. Section-A comprises of 4 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises 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** carry one mark each

1 Write a rational number between rational numbers $\frac{1}{9}$ and $\frac{2}{9}$ 1

2 Factorise : $x^2 - 4x + 4$ 1

3 

In figure PS $\perp l$ and RQ $\perp l$, the degree. Find the measure of y 1

4 Write the distance of point R(2, 5) from y-axis. 1

SECTION-B

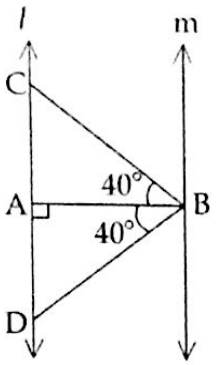
Question numbers **5** to **10** carry two marks each.

5 Write $\frac{3}{13}$ in decimal form and state what kind of decimal expansion does it have ? 2

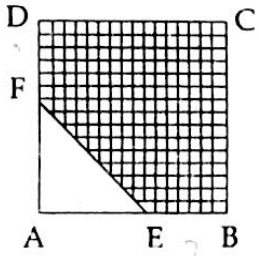
6 ₹Find if $(-2x-5)$ is a factor of the polynomial $p(x) = 3x^4 + 5x^3 - 2x^2 - 4$ or not. 2

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

8 In the figure, $l \| m$. If $\angle ABC = \angle ABD = 40°$ and $\angle A = 90°$, then prove that ΔBCD is isosceles. 2



9 In the figure, ABCD is a square of side 4 cm. E and F are mid - points of AB and AD respectively. Find the area of the shaded region. 2



10 Write coordinates of two points on x - axis and two points on y - axis which are at equal distances from the origin. 2

SECTION-C

Question numbers **11** to **20** carry three marks each.

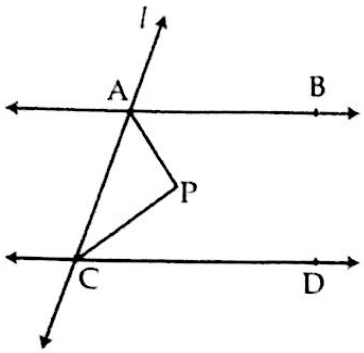
11 Find the values of a and b if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$. 3

12 Find six rational numbers between 3 and 4. 3

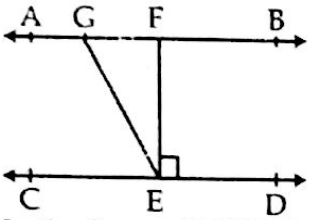
13 If $x + y + z = 0$, show that 3

$x^3 + y^3 + z^3 = 3xyz$

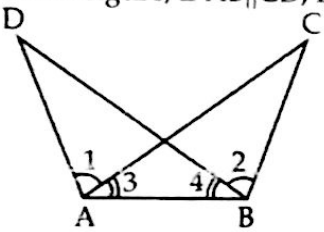
14 Factorise : $27x^3 - (3x - y)^3$ 3

15 

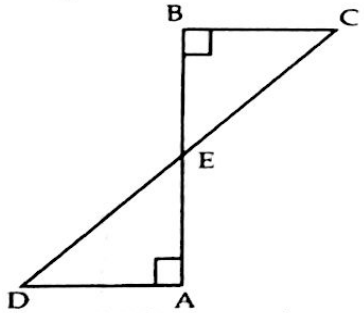
In figure, AB||CD and a transversal l cuts AB and CD at A and C respectively. Bisectors of $\angle A$ and $\angle C$ intersect each other at P. Prove that $\angle APC = 90°$ 3

16 

In the figure, if AB||CD, EF⊥CD and $\angle GED = 126^0$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$. 3

17 

In figure ΔABC and ΔABD are such that $AD = BC$, $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$. Prove that $BD = AC$. 3

18 

AD and BC are equal perpendiculars to a line segment AB in figure. Show that CD bisects AB. 3

19 Find the area of a quadrilateral field ABCD in which AB = 50 m, BC = 18 m, CD = 82 m, DA = 50 m and $\angle CBD = 90°$. 3

20 Plot the following ordered pairs (x, y) of numbers as points in the cartesian plane : 3

x	4	5.5	−2	−1	0	2.5
y	−5	−3	5	−6	5	0

SECTION-D

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

21 Rationalise the denominator of $\frac{1}{\sqrt{2}+\sqrt{3}+\sqrt{5}}$. 4

22 If $x = 9 - 4\sqrt{5}$, find $x^2 + \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$. 4

23 Factorise : $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$. 4

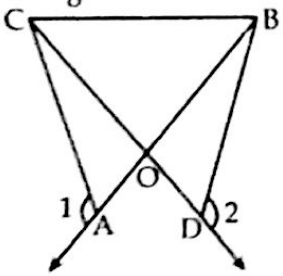
24 Simplify : $\left(\frac{x}{3} + \frac{y}{5}\right)^3 - \left(\frac{x}{3} - \frac{y}{5}\right)^3$. 4

25 Using factor theorem, find the value of 'a', if $2x^4 - ax^3 + 4x^2 - x + 2$ is divisible by $2x + 1$. 4

26 If $x - 3$ and $x - \frac{1}{3}$ are factors of the polynomial $px^2 + 3x + r$, show that $p = r$. 4

27 Rehman and Prakash contributed equal amount towards Prime Minister Relief fund. Prakash and Rahul contributed equal amount towards Prime Minister Relief fund. If Rahul Contributed Rs. 500 how much Rehman contributed ? What value they all are exhibiting by doing so ? Which Euclid Axiom help in reaching the correct answer ? State any one more Euclid Postulate. 4

28 Show that the sum of the three altitudes of a triangle is less than the sum of three sides of the triangle. 4

29 

In figure $OA = OD$ and $\angle 1 = \angle 2$. Prove that ΔOCB is an isosceles triangle. 4

30 If the altitudes AD, BE and CF of a ΔABC are equal, prove that ABC is an equilateral triangle. 4

31 Prove that angles opposite to equal sides of an isosceles triangle are equal. 4