SUMMATIVE ASSESSMENT – I, 2015-16
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 Identify an irrational number among the following decimal expansions : 1

1.11100111001100111001110 0..., 0.909090...,

1.11100111001110011100..., 0.191019101910....

2 Find the value of the polynomial $2+x-x^3$ at $x=-1$. 1

3 In ΔABC, if $\angle A-\angle B=63°$ and $\angle B-\angle C=18°$, find the measure of $\angle B$. 1

4 Write the coordinates of the point of intersection of the x-axis and y-axis. 1

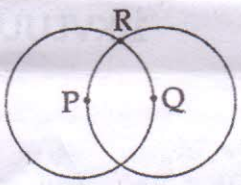
SECTION-B

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

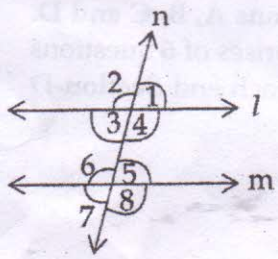
5 If $z = 0.064$, then find the value of $\left(\frac{1}{z}\right)^{\frac{1}{3}}$. 2

6 Find the value of $\left(\frac{-2}{3}\right)^3+\left(\frac{-13}{6}\right)^3+\left(\frac{17}{6}\right)^3$. 2

7 P and Q are centres of the two intersecting circles which intersect at R (see figure). Prove that $PQ=QR=PR$. 2



8 In the figure, line n intersects two parallel lines l and m such that $\angle 2 = 120°$. Find the values of all the exterior angles. 2



9 Plot the points (2, 3), (3, −4), (−4, 5), (−5, −6), (−2,0), (0, 5), (0, −5) and (−5, 0). 2

10 An advertisement board is of the form of an equilateral triangle of perimeter 240 cm. Find the area of the board using Heron's formula (Use $\sqrt{3} = 1.73$) 2

SECTION-C

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

11 Express $32.\overline{12}$ in the form $\frac{m}{n}$, where m and n are integers and $n \neq 0$? 3

12 Prove that $\frac{1}{2+\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} + \frac{1}{2-\sqrt{5}} = 0$. 3

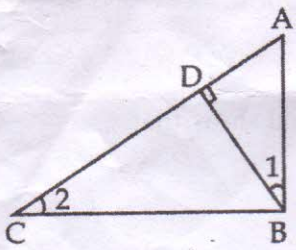
13 Factorise : $x^3 + 8y^3 + 8z^3 - 12xyz$ 3

14 Show that $x-1$ is a factor of the polynomial $x^3 - 13x^2 + 32x - 20$. Hence Factorise the polynomial. 3

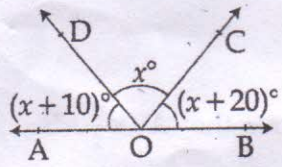
15 Prove that the sum of angles of a triangle is 180°. 3

16 WXYZ is a quadrilateral whose diagonals intersect each other at the point O such that OW = OX = OZ. If $\angle OWX = 50°$, then find the measure of $\angle OZW$. 3

17 In the figure ABC is a right triangle,right angled at B. BD is drawn perpendicular to AC. 3



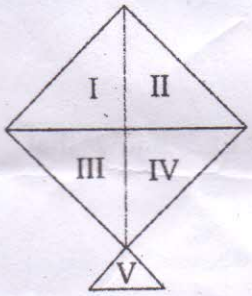
18 In the given figure, AOB is a straight line. Find the vlaue of x. 3



19 What are the names of horizontal and vertical lines drawn to determine the position of any point in the cartesian plane ? What is their point of intersection called ? How many parts of the coordinate plane are formed by these two lines and what are they called ? 3

quadrants

20 A kite is in the shape of a square with a diagonal 48 cm and an equilateral triangle of side 6 cm. It is to be made of 5 different colours as shown in the figure. Find the area of paper of each colour used in it. (Use $\sqrt{3} = 1.73$) 3



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SECTION-D

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

21 Rationalise the denominator and the value of a and b of the following : 4

$$\frac{1}{7-4\sqrt{3}} = a + b\sqrt{3}$$

22 Find $\dfrac{32^{\frac{2}{5}} \times 16^{\frac{3}{4}}}{125^{\frac{1}{3}}}$. 4

23 Divide the polynomial $x^4+3x^3-2x^2+x+10$ by $x+2$ and verify remainder by using remainder theorem. 4

24 Prove that : $(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3 = 3\,(a+b)\,(b+c)\,(c+a)\,(a-b)\,(b-c)\,(c-a)$ 4

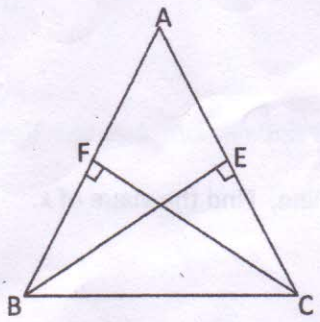
25 State Factor theorem. Using Factor theorem, factorise x^3-3x^2-x+3. 4

26 Find the value of K, if x-1 is a factor of $4x^3 + 3x^2 - 4x + K$. 4

27 ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal show that 4

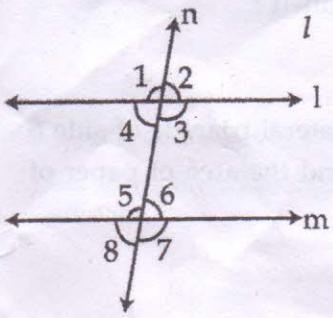
(i) $\Delta ABE \cong \Delta ACF$

(ii) $AB = AC$



28 If a point C lies between two points A and B such that AC=BC then prove that AC=$\frac{1}{2}$AB. 4
Explain by drawing the figure.

29 In the figure, if $l \| m, \angle 1 = (2x + y)°, \angle 4 = (x + 2y)°$ and $\angle 6 = (3y + 20)°$, find $\angle 7$ and $\angle 8$. 4



30 ABCD is a quadrilateral in which diagonals AC and BD intersect at O. Show that 4
AB + BC + CD + DA > AC + BD.

31 In a quadrilateral ABCD, AB is the smallest side and CD is the largest side. Prove that : 4

(i) $\angle A > \angle C$

(ii) $\angle B > \angle D$.

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