

Rinaw Gupta  
IX - B

**SUMMATIVE ASSESSMENT - I, 2016-17**  
**MATHEMATICS**  
**Class - IX**  
**Set - A**

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**

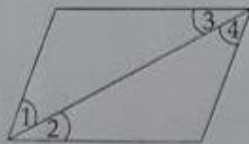
Question numbers 1 to 4 carry one mark each.

- ✓ Simplify:  $\sqrt[4]{\left(\frac{132}{143}\right)^{-2}}$  1
- ✓ Factorise :  $8y^3 - 125x^3$ . 1
- ✓ Is  $\Delta ABC$  possible, if  $\angle A = 60^\circ$ ,  $\angle B = 80^\circ$  and  $\angle C = 40^\circ$ ? 1
- ✓ The perimeter of an equilateral triangle is 60 cm. Find the area of the triangle. 1

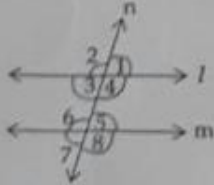
**SECTION-B**

Question numbers 5 to 10 carry two marks each.

- ✓ Express  $1.3\bar{2}$  in the form of  $\frac{p}{q}$ , where p and q are integers and  $q \neq 0$ . 2
- ✓ Using Remainder theorem, find the remainder when  $x^4 - 3x^3 + 2x^2 - 4$  is divided by  $x + 2$ . 2
- ✓ In the given figure ; if  $\angle 1 = \angle 3$ ,  $\angle 2 = \angle 4$  and  $\angle 3 = \angle 4$ , write a relation between  $\angle 1$  and  $\angle 2$  by using an Euclid's axiom. Write the axiom also. 2



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



- ✓ In which quadrant or on which axis do the points  $(0, -3)$ ,  $(-3, 9)$ ,  $(7, 4)$  and  $(5, -3)$  lie? 2
- ✓ 10 If the sides of a triangle are 9 m, 12 m and 15 m, then find its area, using Heron's formula. 2

### SECTION-C

Question numbers 11 to 20 carry three marks each.

- ✓ 11 Let  $a$  and  $b$  be rational and irrational numbers respectively. Is  $a+b$  an irrational number? Justify your answer. 3

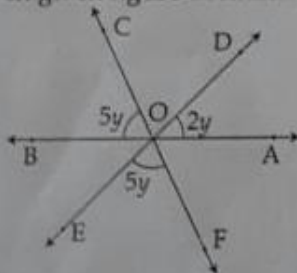
- ✓ 12 Express  $\frac{1}{(1+\sqrt{2})-\sqrt{3}}$  with rational denominator. 3

- ✓ 13 If  $x + \frac{1}{x} = 6$ , find the value of  $x^4 + \frac{1}{x^4}$ . 3

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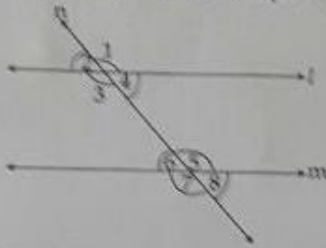
- ✓ 14 Using a suitable identity, find  $(98)^3$ . 3

- ✓ 15 In given figure determine the value of  $y$  and hence find  $\angle EOB$ ,  $\angle FOA$  and  $\angle COD$ . 3

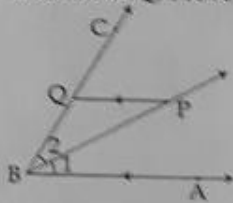


Find the 2

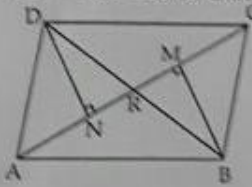
If  $l \parallel m$ ,  $n$  is a transversal (see figure) and  $\angle 1 : \angle 2 = 7 : 5$ , then find all the angles. 3



17 P is a point on the bisector of  $\angle ABC$ . If the line through P is drawn parallel to AB to meet BC at Q. Prove that  $\triangle BPQ$  is isosceles triangle. 3



18 In the figure, BM and DN are both perpendiculars to AC and  $BM = DN$ . Prove that AC bisects BD. 3



19 Locate the points  $A(0, 5)$ ,  $B(4, -6)$ ,  $C(3, 1)$ ,  $D(-2, -6)$ ,  $E(0, -3)$  and  $F(1, 3)$  on the graph paper. Which points have same abscissas? Also, write the points which have same ordinates. 3

20 The sides of a triangular park are 5 m, 7 m and 8 m respectively. Find the cost of levelling the park at the rate of ₹ 10 per  $m^2$ . (Use  $\sqrt{3} = 1.73$ ) 3

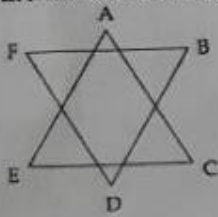
#### SECTION-D

Question numbers 21 to 31 carry four marks each.

21 If  $x = \frac{\sqrt{5} + 1}{\sqrt{5} - 1}$  and  $y = \frac{\sqrt{5} - 1}{\sqrt{5} + 1}$ , then find the value of  $x^2 + y^2$ . 4

22 Simplify:  $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} + \left(\frac{5}{2}\right)^{-3}\right]$  4

- ✓33 If the polynomial  $2 + ax - 2x^2 - 3x^3$ , is exactly divisible by  $x + 1$ , then find the value of  $a$ . Hence, factorise the polynomial. 4
- ✓34 By long division, find the remainder when the polynomial  $2x^4 - 3x^3 + 5x^2 - 4x - 3$  is divided by  $x - 2$ . 4
- ✓35 Factorise :  $t^6 - 7t^3 - 8$ . 4
- ✓36 Find the value of  $\frac{1}{27}r^3 - s^3 + 125t^3 + 5rst$ , when  $s = \frac{r}{3} + 5t$ . 4
- ✓37 A group of students prepared some decorative pieces in the shape of a star for the orphans in an orphanage. Show that :  $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 360^\circ$ . What is the gesture of students ? 4



- ✓38 It is known that  $a - c = 25$  and that  $a = b$ . Show that  $b - c = 25$ . Write the Euclid's axiom that best illustrates this statement. Also give two more axioms other than the axiom used in the above situation. 4
- ✓39 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 also parallel. 4
- ✓40 In a  $\Delta ABC$ ,  $BO$  and  $CO$  are the bisectors of  $\angle ABC$  and  $\angle ACB$  respectively intersecting other at  $O$ . Prove that  $\angle BOC = 90^\circ + \frac{1}{2}\angle A$ . 4
- ✓34 If two isosceles triangles have a common base, prove that the line joining their vertices bisects them at right angles. 4

