

## SUMMATIVE ASSESSMENT - I, 2016-17

## MATHEMATICS (041)

## SET - I

## Class - IX

Time Allowed : 3 hours

Maximum Marks: 90

## General Instructions:

- All questions are compulsory.
- 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.
- There is no overall choice in this question paper.
- Use of calculator is not permitted.

## SECTION-A

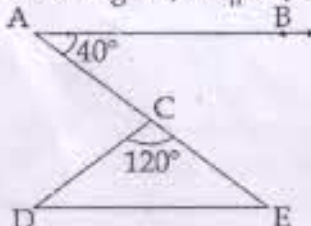
Question numbers 1 to 4 carry one mark each.

- Simplify :  $\sqrt{72} + \sqrt{800} - \sqrt{18}$ . 1
- Factorise :  $6 - x - x^2$ . 1
- Define a reflex angle ? 1
- The area of an equilateral triangle is  $64\sqrt{3} \text{ cm}^2$ . Find its side. 1

## SECTION-B

Question numbers 5 to 10 carry two marks each.

- Write  $\frac{3}{13}$  in decimal form and state what kind of decimal expansion does it have ? 2
- Find the value of  $k$ , if  $2x - 1$  is a factor of the polynomial  $6x^2 + kx - 2$ . 2
- Prove that every line segment has one and only one mid-point. Give Euclid's axiom which is used. 2
- In the figure;  $AB \parallel DE$ ,  $\angle A = 40^\circ$  and  $\angle DCE = 120^\circ$ . Find  $\angle CDE$ . 2



- What are the distances of a point  $(7, -6)$  from  $x$ -axis and  $y$ -axis ? 2
- Find the area of an equilateral triangle whose perimeter is 18 cm, using Heron's formula. (Use  $\sqrt{3} = 1.73$ ) 2

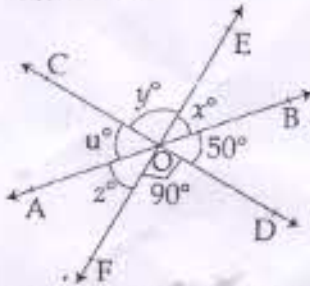
## SECTION-C

Question numbers 11 to 20 carry three marks each.

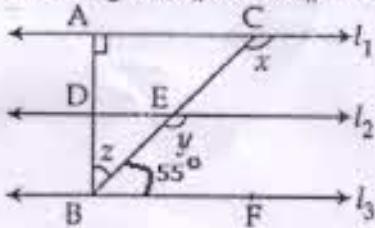
- Represent  $\sqrt{4.5}$  on the number line. 3
- If  $\frac{3 - 2\sqrt{2}}{3 + 2\sqrt{2}} = a + b\sqrt{2}$ , find  $a$  and  $b$ . 3
- Expand :  $(-3x + 5y - 2z)^2$  3

14  $x^2 + \frac{1}{x^2} = 47$ , then find the value of  $x^3 + \frac{1}{x^3}$ . 3

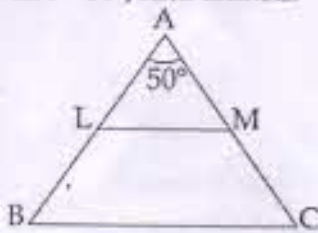
15 Three lines AB, CD and EF meet at a point O, forming angles as shown in the figure. Find the values of  $x, y, z$  and  $u$ . 3



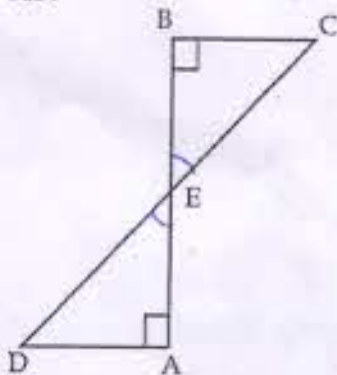
16 In the figure  $l_1 \parallel l_2$  and  $l_2 \parallel l_3$ . If  $AB \perp l_1$  and  $\angle CBF = 55^\circ$ , find the values of  $x, y$  and  $z$ . 3



17 In the figure, ABC is an isosceles triangle in which  $AB = AC$  and LM is parallel to BC. If  $\angle A = 50^\circ$ , find  $\angle LMC$ . 3



18 AD and BC are equal perpendiculars to a line segment AB (see figure). Show that CD bisects AB. 3



19 Draw a  $\triangle ABC$ , whose vertices are  $A(6, 9)$ ,  $B(-6, 12)$  and  $C(12, -6)$ . Measure the lengths of sides AB, BC and AC. Verify that  $AB + AC > BC$ . 3

20 A triangular park in a city has dimensions 30 m, 26 m and 28 m. A gardener has to plant grass inside it at ₹ 1.50 per  $m^2$ . Find the amount to be paid to the gardener. 3

## SECTION-D

Question numbers 21 to 31 carry four marks each.

21 If  $a = \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}}$  and  $b = \frac{\sqrt{5} - \sqrt{2}}{\sqrt{5} + \sqrt{2}}$ , find the value of  $\frac{a^2 + ab + b^2}{a^2 - ab + b^2}$ . 4

Final the value of : 4

22  $(216)^{\frac{1}{3}} + 2(243)^{\frac{1}{3}} - 3(256)^{\frac{1}{4}}$

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

24 Find what must be subtracted from the polynomial  $4y^4 + 12y^3 + 6y^2 + 50y + 26$  so that the obtained polynomial is exactly divisible by  $y^2 + 4y + 2$ . 4

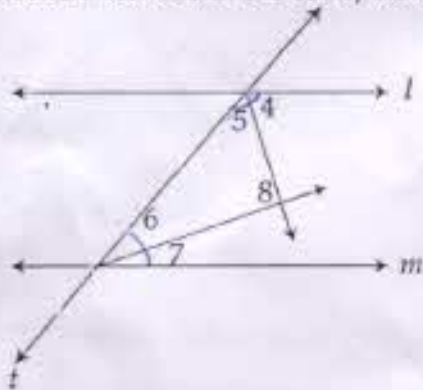
25 Factorise :  $9x^3 - 3x^2 - 5x - 1$  4

26 if  $a + b + c = 6$ , find the value of : 4

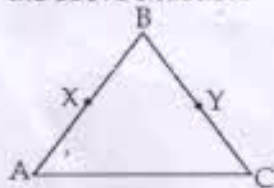
$$(2-a)^3 + (2-b)^3 + (2-c)^3 - 3(2-a)(2-b)(2-c)$$

27 Students in a school are preparing Banner for a rally to make people aware for saving electricity. What value are they exhibiting by doing so ? 4

Parallel lines  $l$  and  $m$  are cut by transversal  $t$ , if  $\angle 4 = \angle 5$ , and  $\angle 6 = \angle 7$ , what is measure of angle 8 ?

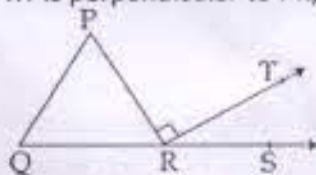


28 In the given figure, we have X and Y are the mid-points of AB and BC and  $AX = BY$ . Show that  $AB = BC$ . State which axiom you use here. Also give two more axioms other than the axiom used in the above situation. 4



29 A transversal intersects two parallel lines. Prove that the bisectors of any pair of corresponding angles so formed are parallel. 4

30 In the figure, side QR of triangle PQR has been produced to the point S. If  $\angle P : \angle Q : \angle R = 3 : 2 : 1$  and RT is perpendicular to PR, then find  $\angle TRS$ . 4



31 ABC and DBC are two isosceles triangle on the same base BC and vertices A and D on the same side of BC. AD is extended to intersect BC at P, show that 4

- $\triangle ABD \cong \triangle ACD$
- AP is perpendicular bisector of BC.