

# SUMMATIVE ASSESSMENT-I, 2016-17

## MATHEMATICS

Time : 3 Hrs.

Grade : IX

M.M. : 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 :  $\sqrt[4]{64^{-2}}$

Factorise :  $x^2 - 3x$

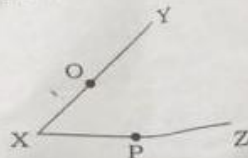
If a transversal intersects two parallel lines, then which of the pairs of angles is equal ?

The point P (a, b) lies in II Quadrant. Find out which of a or b is greater ?

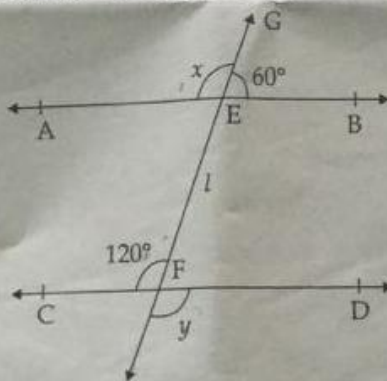
SECTION-(B)

Question numbers 5 to 10 carry two marks each.

5. Express  $18\sqrt{48}$  in the form of  $\frac{p}{q}$ , where  $p$  and  $q$  are integers,  $q \neq 0$ . 2
6. If 2 is a zero of  $2x^2 + px - 14$ , then find the value of  $p$ . 2
7. In the figure;  $OX = \frac{1}{2}XY$ ,  $PX = \frac{1}{2}XZ$  and  $OX = PX$ . Show that  $XY = XZ$ , using an Euclid's axiom. 2



8. In the figure, find the values of  $x$  and  $y$  and then show that  $AB \parallel CD$ . 2



9. Write the name of the point where the coordinate axes meet each other. Also, write name of each part of the plane formed by these lines. 2
10. Two sides of a triangle are 48 cm and 70 cm. If perimeter is 154 cm, find its area. 2

Handwritten calculations for question 10:  

$$\frac{154}{2} = 77$$

$$77 - 48 = 29$$

$$77 - 70 = 7$$

$$\frac{29 \times 7}{2} = \frac{203}{2} = 101.5$$

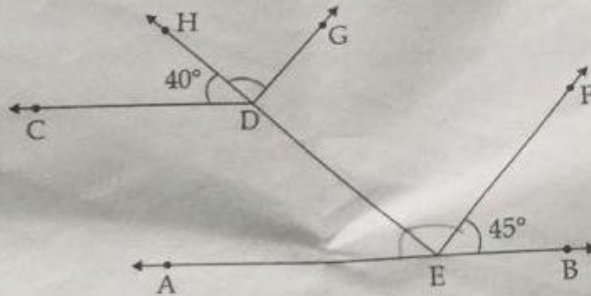
SECTION - (C)

Question numbers 11 to 20 carry three marks each.

11. Represent  $\sqrt{3}$  on the number line. 3
12. Prove that  $\frac{1}{2+\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} + \frac{1}{2-\sqrt{5}} = 0$ . 3
13. Find the product  $(x+y+2z)(x^2+y^2+4z^2-xy-2yz-2zx)$ . 3
14. If  $x^2 + \frac{1}{x^2} = 38$ , then find the value of  $x^3 - \frac{1}{x^3}$ . 3
15. In the figure, lines  $PQ$  and  $RS$  intersect each other at point  $O$ . If  $\angle POR : \angle ROQ = 5:7$ , find all the indicated angles. 3

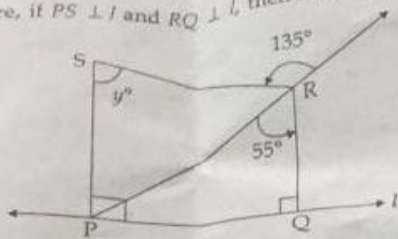


16. In given figure,  $AB \parallel CD$  and  $EF \parallel DG$ . Find  $\angle GDH$ ,  $\angle AED$  and  $\angle DEF$ . 3

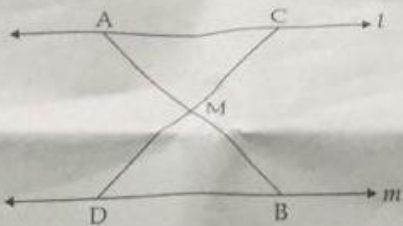


$= 2x + \frac{1}{x} - 2/x$

17. In the figure, if  $PS \perp l$  and  $RQ \perp l$ , then find the measure of  $y$  : 3



18. In given figure  $l \parallel m$  and  $M$  is the mid point of a line segment  $AB$ . Show that  $M$  is also the mid-point of any line segment  $CD$  having its end points  $C$  and  $D$  on  $l$  and  $m$  respectively. 3



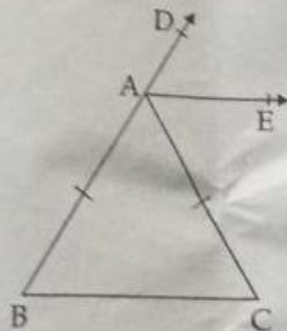
19. On the graph paper, plot a point  $X(-3, 2)$ . Plot reflections of point  $X$  in  $x$ -axis and  $y$ -axis and denote these points by  $Y$  and  $Z$  respectively. Name the type of triangle  $XYZ$  so formed. 3
20. The sides of a triangular park are 5 m, 7 m and 8 m respectively. Find the cost of 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  $x = 3 - 2\sqrt{2}$ , find the value of  $x^4 - \frac{1}{x^4}$ . 4

22. If  $\frac{9^{m+1} \times (3^{-n/2})^{-2} - 27^n}{(3^m \times 2)^3} = \frac{1}{729}$  and  $m+n=5$ ; find the values of  $m$  and  $n$ . 4
23. The polynomial  $ax^3 + 3x^2 - 3$  and  $2x^3 - 5x + a$  when divided by  $x - 4$ , leave the remainder  $p$  and  $q$  respectively. If  $2p = q$ , find the value of 'a'. 4
24. Using long division method, show that the polynomial  $p(x) = x^3 + 1$  is divisible by  $q(x) = x + 1$ . Verify your result using factor theorem. 4
25. Factorise :  $a^7 - ab^6$  4
26. Simplify :  $\frac{(x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3}{(x - y)^3 + (y - z)^3 + (z - x)^3}$  4
27. If two lines are parallel to third line, prove that they are parallel to each other. How can it be related to real life. ? 4
28. Solve the equation  $x - 35 = 75$  and state which axiom you use here. Also give two more axioms other than the axiom used in the above situation. 4
29. 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
30. In figure;  $\Delta ABC$  is an isosceles triangle in which  $AB = AC$  and  $AE$  bisects  $\angle CAD$ . Prove that  $AE \parallel BC$ . 4



31.

ABCD is a square and  $BX = BY$  prove that :

(i)  $\triangle DCX \cong \triangle DAY$

(ii)  $DY = DX$

(iii)  $\angle DXC = \angle DYA$

