

## SEMESTER-TWO

## MATHEMATICS

Grade-10

### Sample Paper-2

**Max. Marks: 50**

**Time Allowed: 90 minutes**

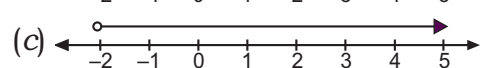
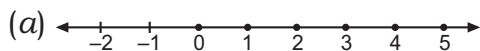
#### General Instructions:

- (i) This question paper consists of 45 questions in 5 sections.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) Section A consists of 10 Multiple Choice Questions carrying 1 mark each.
- (iv) Section B consists of 10 Fill in the Blank Type Questions carrying 1 mark each.
- (v) Section C consists of 10 True or False Type Questions carrying 1 mark each.
- (vi) Section D consists of 10 Very Short Answer Questions carrying 1 mark each.
- (vii) Section E consists of 5 Short Answer Questions carrying 2 marks each.

#### Section A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

1. The number line representing the solution set for the linear inequality  $3x + 8 > 2$ ;  $x$  is a real number is



(d) None of these

2. Albert says that he has 7 marbles more than five times the marbles Ella has. Albert has 37 marbles. How many marbles does Ella has?  
(a) 7 (b) 8 (c) 6 (d) None of these
3. Find the rule for the following mapping:
- |              |              |              |              |              |              |
|--------------|--------------|--------------|--------------|--------------|--------------|
| $x$          | 0            | 1            | 2            | 3            | 4            |
| $\downarrow$ | $\downarrow$ | $\downarrow$ | $\downarrow$ | $\downarrow$ | $\downarrow$ |
| $y$          | -1           | 1            | 3            | 5            | 7            |
- (a)  $y = x^2 + 1$  (b)  $y = 2x - 1$  (c)  $y = 2x + 1$  (d)  $y = x^2 - 1$
4. If  $(x, 7) = (5, 7)$ , then the value of  $x$  is:  
(a) 5 (b) 7 (c) -5 (d) None of these
5. The pair of simultaneous linear equations  $x + 2y - 5 = 0$ ,  $7x + 3y - 13 = 0$  has a unique solution. Then, the values of  $x$  and  $y$  are  
(a)  $x = 1, y = 2$  (b)  $x = 2, y = 1$  (c)  $x = 3, y = 1$  (d)  $x = 1, y = 3$
6. If  $\mathbf{r} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$  and  $\mathbf{s} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ , calculate  $6(\mathbf{r} + 2\mathbf{s})$   
(a)  $\begin{pmatrix} -1 \\ 3 \end{pmatrix}$  (b)  $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$  (c)  $\begin{pmatrix} 7 \\ 3 \end{pmatrix}$  (d)  $\begin{pmatrix} -6 \\ 18 \end{pmatrix}$
7. Find the length of the vector  $\mathbf{P} = \begin{pmatrix} -5 \\ 12 \end{pmatrix}$   
(a) 17 (b) 13 (c) 25 (d) 7
8. How many lines of symmetry has an isosceles triangle?  
(a) 1 (b) 2 (c) 3 (d) 4
9. The angles of a triangle are in the ratio 3 : 2 : 1. Find the value of the smallest angle.  
(a)  $30^\circ$  (b)  $45^\circ$  (c)  $60^\circ$  (d)  $90^\circ$
10. A tank contains 250 litres of water. If 96 litres is used, what percentage of the original quantity is left?  
(a) 61.6% (b) 60.5% (c) 59.0% (d) 54.2%

**Section B**

Fill in the blanks with a suitable word for each of the questions 11 – 20.

11. The word \_\_\_\_\_ means per hundred or out of hundred.
12. \_\_\_\_\_ is a comparison of two or more similar quantities.
13. A \_\_\_\_\_ is an action of taking an object and moving it to a different location without altering its shape or size.
14. A reflection is the \_\_\_\_\_ you see when you look in a mirror.
15. Two or more vectors are parallel, if one is a \_\_\_\_\_ of the others.
16. A quantity that has only magnitude is called a \_\_\_\_\_.
17. Two linear equations in two variables form a system of \_\_\_\_\_.
18. An \_\_\_\_\_ is a pair of objects taken in a specific order.
19. \_\_\_\_\_ is the process of finding the solutions of the equation.
20. Solutions of inequalities can be represented on a \_\_\_\_\_.

**Section C**

State whether the following statements are true or false for each of the questions 21–30.

21.  $x = 3$  is a solution of the equation  $4x - 9 = 3$ .
22.  $x = 6$  is not a solution of the equation  $2(x - 3) - 17 = 13 - 3(x + 2)$ .
23. A relation can be represented by matching diagram.
24. The rule of the mapping  
 $\{(2, 4), \{(3, 6), \{(4, 8), \{(5, 10)\}$  is  $y = 2x$ .
25. If  $x + 3y = 8$  and  $x + y = 2$  is a pair of simultaneous equations, then  $x = -1$  and  $y = -3$  is the solution.
26. Bearings give directions in terms of an angle.
27. If the reflection line is  $y = x$ , then the given mapping is  $(x, y) \rightarrow (x, y)$ .
28. A distance time graph shows only distance of the journey.
29. A speed time graph shows the relationship between the speed and the time of a journey.
30. Median refers to the value which lies at the end of the data.

## Section D

Answer each of the questions 31 – 40.

- 31.** Solve for  $x$ :  $\frac{1-2x}{5} = 3$ .
- 32.** Solve the following inequalities and represent the solution on the number line:  $1 \leq 3(x-2) + 4 < 10$ ,  $x \in \mathbf{N}$
- 33.** Draw the graph of:  $x + 3y + 1 = 0$
- 34.** Find the gradient of the line which passes through the points: P(3, -2) and Q(6, 7)
- 35.** Solve the following pair of linear equations by the Elimination Method:  $2x + 7y - 11 = 0$ ;  $3x - y - 5 = 0$ .
- 36.** Given that  $\mathbf{s} = \begin{pmatrix} x-4 \\ 3 \end{pmatrix}$  and  $\mathbf{t} = \begin{pmatrix} 5 \\ 3-y \end{pmatrix}$ , find  $x$  and  $y$  if  $\mathbf{s} = \mathbf{t}$ .
- 37.** Find the magnitude of the following vector:  $\vec{PQ} = \begin{pmatrix} 9 \\ 12 \end{pmatrix}$
- 38.** Find the image of the point P(-1, 2)
- 39.** The heights of 5 pupils in a group are:  
152 cm, 170 cm, 156 cm, 164 cm and 150 cm  
Find the mean height.
- 40.** Find the median of the following data:  
2, 5, 3, 2, 4, 5, 2, 4, 6, 8, 7, 9

## Section E

Answer each of the questions 41 – 45.

- 41.** Solve the following pair of linear equations graphically:  
 $2x + y - 6 = 0$ ;  $4x - 2y - 4 = 0$ .
- 42.** A function is defined by  $f: x \rightarrow 2x - 3$  on the domain  $\{-2, -1, 0, 1, 2\}$ , find the range of the function
- 43.** If  $\mathbf{p} = \begin{pmatrix} 4x+3 \\ 5+2y \end{pmatrix}$  and  $\mathbf{q} = \begin{pmatrix} 11 \\ -5 \end{pmatrix}$ , then find  $x$  and  $y$  when  $\mathbf{p} = \mathbf{q}$ .
- 44.** The coordinates of the image of a shape under reflection in Y-axis are:  
 $A_1(5, -1)$ ,  $B_1(2, -1)$ ,  $C_1(1, 2)$ ,  $D_1(3, 4)$ ,  $E_1(5, 4)$ ,  $F_1(6, 1)$ . Draw the original shape in the coordinates plane.
- 45.** The length of a field 1.2 km long is represented on a map by a line 40 mm long. What is the scale of the map?