

**Class: 7**

**Subject: Mathematics**

**Topic: OASK1507SA202**

**No. of Questions: 28**

**Time: 2Hrs.**

**M.M. 50**

**General Instructions:**

1. **All** questions are **compulsory**.
2. The question paper consists of **28** questions and it is divided into three sections A, B and C.
3. **Section A** comprises of **10** question carrying 1 mark each.
4. **Section B** comprises of **14** questions carrying 2 marks each.
5. **Section C** comprises of **4** questions carrying 3 marks each.
6. Question numbers **1 to 10** in **Sections A** are multiple choice questions where you are to select one correct option out of the given four.

**SECTION – A**

Q1. If there is a discount of 40% on an article costing Rs. 70000, then the price after discount is:

- (a) Rs. 4500
- (b) Rs. 4200
- (c) Rs. 4400
- (d) Rs. 4600

Sol. (b)

$$\text{Discount} = 40\% \text{ on Rs. } 7000 = \frac{4}{100} \times 7000 = \text{Rs. } 2800$$

$$\text{Therefore, SP} = \text{Rs. } (7000 - 2800) = \text{Rs. } 4200.$$

Q2. Which of the following is the greatest rational number?

- (a)  $15/7$
- (b)  $15/8$
- (c)  $15/10$
- (d)  $15/12$

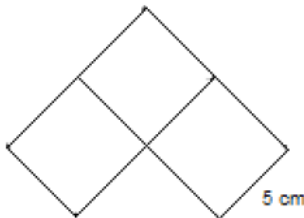
Sol. (a)

Since the numerators are equal, so the rational number with the least denominator is the greatest.

- Q3. To construct an equilateral triangle, the minimum requirement is:
- (a) Measure of one angle
  - (b) Measure of one side
  - (c) Measure of two sides
  - (d) Measure of one side and one angle

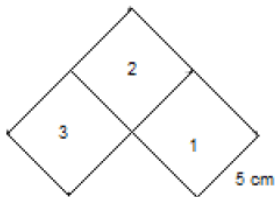
Sol. (b)

- Q4. The figure below is made up of 3 squares of sides 5 cm. What is the perimeter of the figure?



- (a) 15 cm
- (b) 30 cm
- (c) 40 cm
- (d) 50 cm

Sol. (c)



$$\begin{aligned}\text{Perimeter of the figure} &= \text{outer boundary of the figure} \\ &= \text{boundary of } (1^{\text{st}} \text{ square} + 2^{\text{nd}} \text{ square} + 3^{\text{rd}} \text{ square}) \\ &= (5 + 5 + 5) + (5 + 5) + (5 + 5 + 5) \text{ cm} \\ &= 40 \text{ cm}\end{aligned}$$

- Q5. Choose the constant terms in the expression " $x^4 - 6x^2 + 2x - 3$ ".
- (a) 1
  - (b) -6
  - (c) 3
  - (d) -3

Sol. (d)  
-3 is the constant term.

Q6.  $a \times a \times a \times a \times y \times y \times y \times y \times z \times z$  can be written as

- (a)  $a^4 y^4 z^2$
- (b)  $ayz^{10}$
- (c)  $ay^8 xz^2$
- (d)  $ayz^8$

Sol. (a)

$$a \times a \times a \times a \times y \times y \times y \times y \times z \times z = a^4 y^4 z^2$$

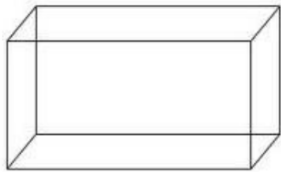
Q7. Which of the following figure has 7 lines of symmetry?

- (a) Regular hexagon
- (b) Regular octagon
- (c) Regular heptagon
- (d) Regular triangle

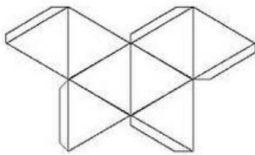
Sol. (c)

Number of lines of symmetry of a regular polygon is equal to its number of sides. Since, regular heptagon has 7 sides, It has 7 lines of symmetry.

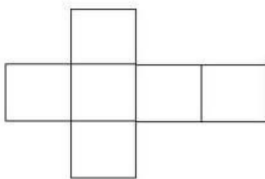
Q8. Net for the following solid is :



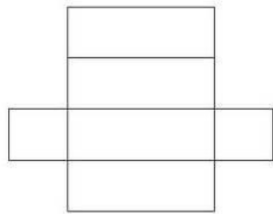
(a)



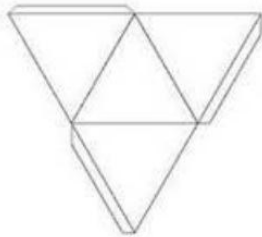
(b)



(c)



(d)



Sol. (c)

Q9. A regular hexagon has \_\_\_\_\_ centre of rotation.

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Sol. (a)

Q10. For what value of  $k$ , we have  $7x^2 - 5x + k = -4$ , given that  $x = -2$ ,

- (a) 22
- (b) -42
- (c) -22
- (d) 42

Sol. (b)

Substituting the value of  $x$  in the given expression, we get:

$$7 \times (-2)^2 - 5 \times (-2) + k = -4$$

$$28 + 10 + k = -4$$

$$38 + k = -4$$

$$\text{Thus, } k = -42$$

## SECTION - B

Q11. A family reduced the consumption of sugar from 10 kg to 8 kg per month due to increase in price. Find the percentage decrease in consumption.

Sol. Decrease in consumption =  $10 - 8 = 2$  kg

Therefore,

$$\begin{aligned} \text{Percentage Decrease} &= \left( \frac{\text{Decrease in value}}{\text{original value}} \times 100 \right) \% \\ &= \frac{2}{10} \times 100 = 20\% \end{aligned}$$

Q12. Write the rational form of the decimal and represent it on a number line:

(a)  $-0.25$

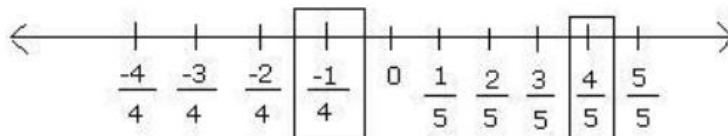
(b)  $0.8$

Sol. The rational number forms of the given decimals are:

$$(a) -0.25 = \frac{-25}{100} = \frac{-5}{20} = \frac{-1}{4}$$

$$(b) 0.8 = \frac{8}{10} = \frac{4}{5}$$

The rational numbers obtained above can be represented as follows:



Q13. Is it possible to construct triangle with the following sides?

(a) 8 cm, 3 cm and 4 cm.

(b) 9 cm, 5 cm and 4 cm.

Sol. (a)

Let the triangle to be constructed be ABC, Where  $AB = 8$  cm,  $BC = 3$  cm and  $AC = 4$  cm

Now,  $BC + AC = 3 + 4 = 7$  cm

And  $AB = 8$  cm

Therefore,  $BC + AC < AB$ .

That is the sum two sides is not greater than the third side.

Hence, the triangle cannot be constructed.

(b)

Let the triangle to be constructed be XYZ

Where  $XY = 9$  cm,  $YZ = 5$  cm and  $XZ = 4$  cm

Now,  $YZ + XZ = 5 + 4 = 9$  cm

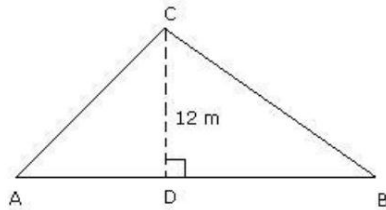
And  $XY = 9$  cm

Therefore,  $YZ + XZ = XY$ .

That is the sum two sides is not greater than the third side.

Hence, the triangle cannot be constructed.

- Q14. Find AB, if the area of the triangle ABC is  $48\text{m}^2$  and the height CD is 12 m.



- Sol. Area of the triangle ABC =  $48\text{ m}^2$

Height,  $CD = 12$  m

Area =  $\frac{1}{2} \times \text{base} \times \text{height}$

$$48 = \frac{1}{2} \times AB \times 12$$

$$6 \times AB = 48$$

$$AB = 8\text{ m}$$

Thus, base  $AB = 8$  m

- Q15. Simplify:  $3(a + b) - (2a - b) + 4a - 7$ .

- Sol.  $3(a + b) - (2a - b) + 4a - 7$

$$= 3a + 3b - 2a + b + 4a - 7$$

$$= (3a - 2a + 4a) + (3b + b) - 7$$

$$= 5a + 4b - 7$$

Q16. If  $5^{2x+1} \div 25 = 125$ , Find the value of x.

Sol. We have,

$$5^{2x+1} \div 25 = 125$$

$$\Rightarrow 5^{2x+1} \div (5 \times 5) = 5 \times 5 \times 5$$

$$\Rightarrow 5^{2x+1} \div 5^2 = 5^3$$

$$\Rightarrow 5^{2x+1-2} = 5^3$$

$$\Rightarrow 5^{2x-1} = 5^3$$

Since bases are equal, powers are also equal.

$$\therefore 2x - 1 = 3$$

$$\Rightarrow 2x = 3 + 1 = 4$$

$$\Rightarrow x = \frac{4}{2} = 2$$

Hence,  $x = 2$

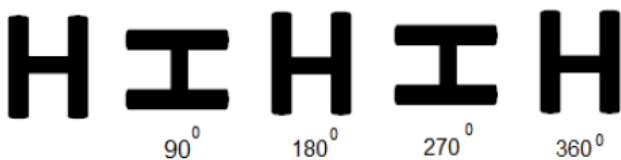
Q17. Given an example of an alphabet which has 2 lines of symmetry as well as rotational symmetry of order 2.

Sol. The alphabet is : H

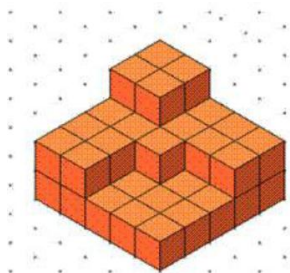
It has 2 lines of symmetry as shown below:



After rotating the letter H through  $180^\circ$ , we find that the image remains same. So the order of rotational symmetry is 2.

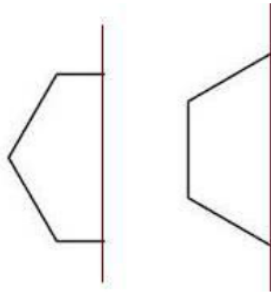


Q18. Count the number of unit cubes in the following solid.

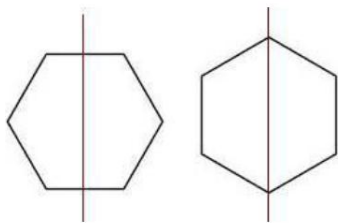


Sol. Number of cubes in the first layer =  $5 \times 5 = 25$   
Number of cubes in the second layer =  $13 + 4 = 17$   
Number of cubes in third layer = 4  
Hence, total number of cubes =  $25 + 17 + 4 = 46$

Q19. Complete the following images whose one half and axis of symmetry is given.



Sol. Drawing the relational part, the images become as follows:



Q20. Express the following numbers in exponent form.

- (a) 343000  
(b) 2048

Sol. (a)  
 $343000 = 343 \times 1000$   
 $= 7 \times 7 \times 7 \times 10 \times 10 \times 10$   
 $= 7^3 \times 10^3$ .

(b)  
 $2048 = 2 \times 1024$   
 $= 2 \times 2 \times 512$   
 $= 2 \times 2 \times 2 \times 256$   
 $= 2 \times 2 \times 2 \times 2 \times 128$   
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 64$   
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 32$   
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 16$



$$\begin{aligned} &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 8 \\ &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= 2^{11} \end{aligned}$$

Q21. Find the value of expression  $(x + y)^2 - (x - y)^2$ , if  $x = \frac{1}{2}$ ,  $y = \frac{1}{4}$ .

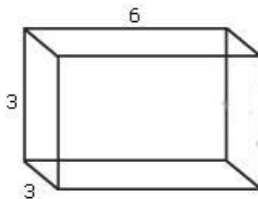
Sol.

$$\begin{aligned} &(x + y)^2 - (x - y)^2 \\ &= x^2 + y^2 + 2xy - (x^2 + y^2 - 2xy) \\ &= 4xy \end{aligned}$$

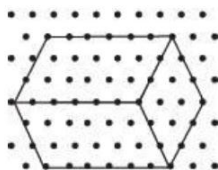
Putting  $x = \frac{1}{2}$  and  $y = \frac{1}{4}$ , we get

$$(x + y)^2 - (x - y)^2 = 4 \times \frac{1}{2} \times \frac{1}{4} = \frac{1}{2}$$

Q22. Given is an oblique sketch of a cuboid. Draw an isometric sketch for this cuboid.



Sol. The corresponding isometric sketch is:



Q23. A student has got following marks in five subjects:

30, 35, 40, 25, 45

The maximum marks for each subject is 50. Find his percentage of marks.

Sol.

$$\begin{aligned} \text{Total maximum marks} &= 50 \times 5 = 250 \\ \text{Total marks obtained} &= 30 + 35 + 40 + 25 + 45 = 175 \\ \text{Percentage of marks} &= \frac{175}{250} \times 100 = 70\% \end{aligned}$$

Q24. What number must be divided by  $15\frac{5}{4}$  so that the quotient is 15?

Sol. Let the required number be  $y$ .

$$15\frac{5}{4} \div y = 15$$

$$\frac{65}{4} \times \frac{1}{y} = 15$$

$$\frac{1}{y} = \frac{15 \times 4}{65}$$

$$y = \frac{65}{15 \times 4}$$

Since 15 and 65 have common factor 5, we get

$$y = \frac{13}{3 \times 4}$$

$$y = \frac{13}{12} = 1\frac{1}{12}$$

Thus, the required number is  $1\frac{1}{12}$ .

## SECTION - C

Q25. Raju owns a plot which is  $1\frac{1}{3}$  acres in size. If the value of land is Rs. 48,000 per acre, what is the value of his plot?

Sol. This is a problem of multiplication of rational numbers.

$$\text{Size of Raju's plot} = 1\frac{1}{3} \text{ acres}$$

Value of land per acre = Rs. 48,000 per acre.

$$\text{So, value of Raju's plot} = \text{Rs. } 48000 \times 1\frac{1}{3}$$

$$= \text{Rs. } 48000 \times \frac{4}{3}$$

$$= \text{Rs. } (16000 \times 4)$$

$$= \text{Rs. } 64,000$$

Thus, the value of Raju's land is Rs. 64,000.

Q26. Mohan purchased an old scooter for Rs. 12000 and spent Rs. 2850 on its overhauling. Then, he sold it to his friend Sohan for Rs. 13860. How much percent did he gain or lose?

Sol. Cost Price of the scooter = Rs. 12000

Overheads = Rs. 2850

Total cost price = Rs. (12000 + 2850) = 14850

Selling Price = Rs. 13860

Since CP > SP, Mohan suffers a loss.

Loss = Rs. (14850 - 13860) = Rs. 990

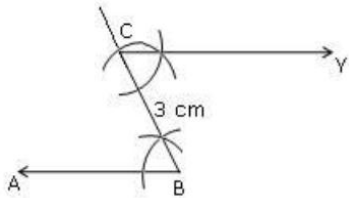
$$\text{Loss \%} = \left( \frac{\text{loss}}{\text{Total CP}} \times 100 \right) \%$$

$$\begin{aligned} &= \left( \frac{990}{14850} \times 100 \right) \% \\ &= 6\frac{2}{3} \% \end{aligned}$$

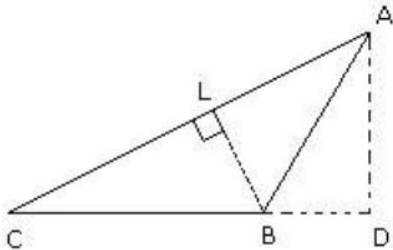
Q27. Draw an angle ABC of  $60^\circ$  such that  $BC = 3$  cm, Through B draw a line parallel to AB.

Sol. Steps of construction:

1. Draw an angle ABC of  $60^\circ$
2. Cut  $BC = 3$  cm.
3. Through C, draw a line parallel to AB by making an angle of  $60^\circ$  on BC, as shown.
4. Hence, CY is parallel to AB.



Q28. In triangle ABC,  $AC = 10$  cm,  $BC = 4$  cm and  $AD = 6$  cm. Find the length of BL.



Sol. Given that, In  $\triangle ABC$ ,  
 $BC = \text{base} = 4$  cm;  $AD = \text{height} = 6$  cm

$$\begin{aligned} \text{Area of triangle } ABC &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 4 \times 6 \\ &= 12 \text{ cm}^2 \end{aligned}$$

Also, in  $\triangle ABC$ ,  
 $AC = \text{base} = 10$  cm ;  $BL = \text{height} = h$  (say)

$$\begin{aligned} \text{Area} &= 12 \text{ cm}^2 \\ \text{Area of triangle} &= \frac{1}{2} \times b \times h \\ 12 &= \frac{1}{2} \times 10 \times h \\ 5h &= 12 \end{aligned}$$

$$h = \frac{12}{5} = 2.4 \text{ cm}$$

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