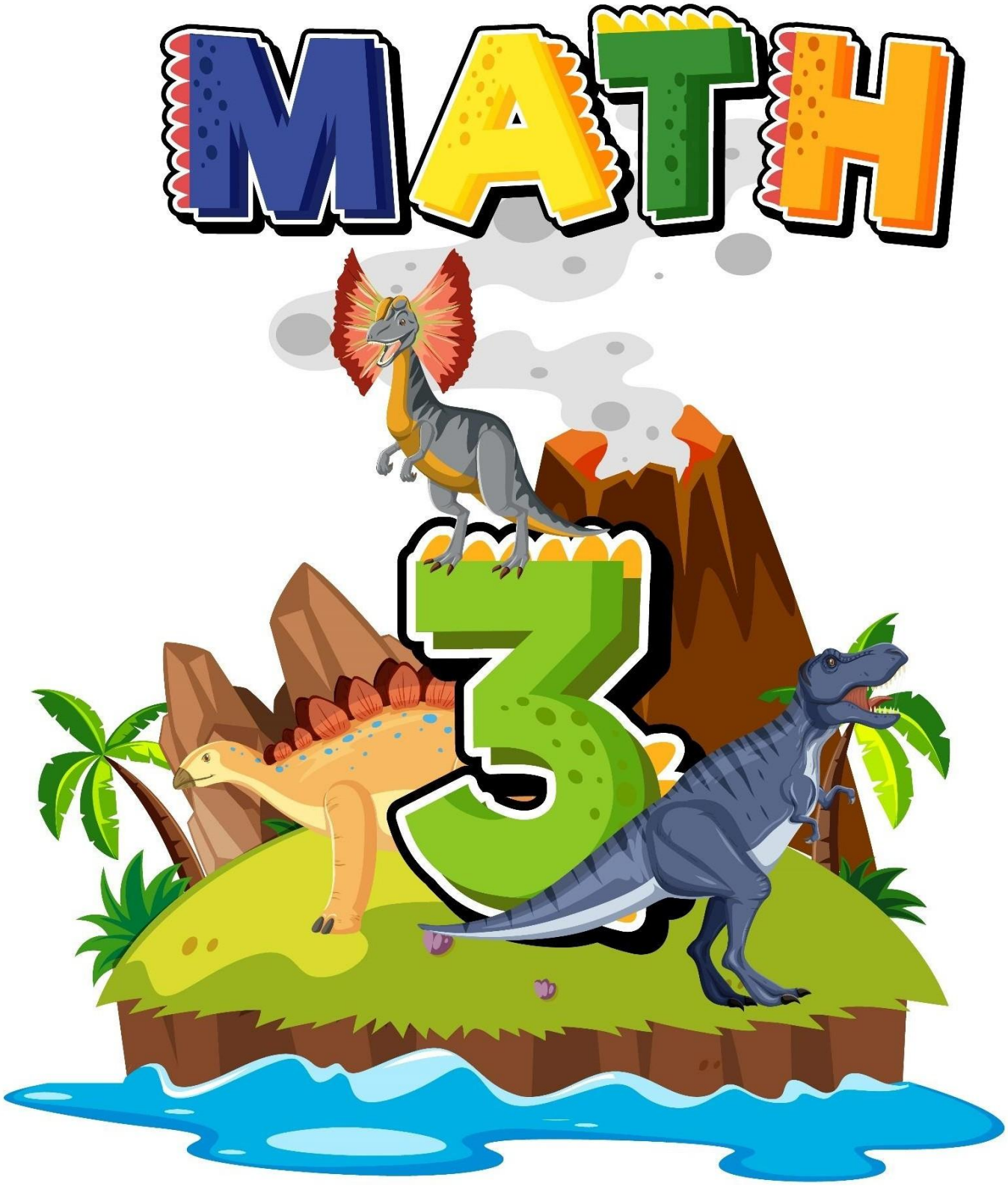


CHAPTER 17: UNITARY METHOD

UNITARY METHOD

➢ INTRODUCTION

Unitary method is self indicating that this is the method for finding the value of unit article if the values of two or more articles is given. This method is widely used for the simplification of word based problems in arithmetic and geometry. In this chapter we will learn about the concept and use of unitary method.

➢ UNITARY METHOD AND ITS USE

Unitary method is used for solving the problems if there are variation in the given quantity. In this method different quantities are converted into single unit and required unit is obtained by arithmetic operations. If a car travels 20 km in 15 minutes and it is required to find the distance travelled by car in 60 minutes then distance travelled by the car in 1 minute must be carried out, that is obtained by the division of $\frac{20}{15}$ Therefore, the distance travelled by the car in 60 minutes is obtained by multiplying the distance travelled in 1 minute by $60 = \frac{20}{15} \times 60 = 80$ kilometres.

Questions:

1. The weight of 4 coins is 150 grams. What is the weight of 10 such coins?

   (a) 380 grams

   (b) 400 grams

   (c) 500 grams

   (d) 1500 grams

   (e) None of these

   Answer: (a)

   Explanation The weight of 4 coins = 150 grams therefore, the weight of 1 coin $\frac{152}{4} = 38$ grams i.e, the weight of 10 coins $10 \times 38 = 380$ gram.

❖ Applications of Unitary Method

The given number of articles is converted into single unit and the value of required number of articles is obtained. The cost of 7 articles is Rs 686, for finding the cost of one article Rs 686 is divided by 7. Therefore, the cost of one article, $\frac{686}{7} = Rs.98$ and the cost of 12 such articles $98 \times 12 = Rs.1176$

2. A company buys 45 computers. If the cost of total number of hard disks is B 84330, then what will be the cost of 96 such hard disks?

(a) Rs 179908

(b) Rs 179904

(c) Rs 179910

(d) Rs 170000

(e) None of these

Answer: (b)

Explanation:

The cost of 45 hard disks is? 84330. Therefore, the cost off one hard disk $\frac{84330}{45} = Rs.1874$

The cost of 96 such hard disks

$\frac{84330}{45} = Rs.1874$

The cost of 96 such hard disk $1874 \times 96 = Rs.179904$

3. The total length of 6 equal plane figures is 54 metres. What will be the total length of 9 such plane figures?

(a) 82 metres

(b) 80 metres

(c) 81 metres

(d) 78 metres

(e) None of these

Answer: (c)

Explanation:

The length of one figure $= \frac{54}{6} = 9$ metres.

Therefore, the length of 9 such figures = $9 \times 9 = 81$ metres.

4. A wood cutter cuts 8 stems of trees in 18 hours. How many stems of trees are cut by him in 9 hours?

(a) 6

(b) 8

(c) 3

(d) 4

(e) None of these

Answer: (d)

Explanation:

In one hour wood cutter cuts stems of trees $= \frac{8}{18}$ Therefore, in 9 hours he cuts stems of trees $= \frac{8}{18} \times 9 = 4$

5. If the cost of 10 kilograms of rice is Rs 120, then what is the total cost of 560 kilograms of rice?

(a) Rs 6720

(b) Rs 9840

(c) Rs 10,000

(d) Rs 6730

(e) None of these

Answer: (a)

The cost of 10 kg of rice is Rs 120, therefore, the cost of one kg of rice $= \frac{120}{10} = Rs.12$ and the cost of 560 kg of rice $= 560 \times 12 = Rs.6720$

6. How many computers can be bought for Rs 44000 if the cost of four computers is Rs 22000?

(a) 7

(b) 8

(c) 9

(d) 10

(e) None of these

Answer: (b)

Explanation:

The cost of four computer sets is Rs 22000.

Hence, the cost of one computer $\frac{22000}{4} = Rs.5500$

Thus, for Rs 44000 number of computers can be bought $= \frac{44000}{5500} = 8$

7. Peter bought 3 chairs for Rs 3600 and Miriam bought the same number of chairsfor? 3900. If the cost of each chair is equal then how much more money is paid by Miriam for each chair?

(a) Rs 80

(b) Rs 98

(c) Rs 100

(d) Rs 60

(e) None of these

Answer: (c)

The cost of one chair bought by Peter $= \frac{3600}{3} = Rs.1200$ the cost of one chair bought by Mariam $= \frac{3900}{3} = Rs.1300$

Hence, Rs 1300 - 1200 = Rs 100 more money is paid by Mariam for each chair.

8. Speed of a car is 60 kilometres per hour. How much distance will it travel in 10 minutes?

(a) 10

(b) 18

(c) 12

(d) 7

(e) None of these

Answer: (a)

Explanation:

Car travels 60 km in 60 minutes.

Hence, in one minute it travels $\frac{60}{60} = 1$ km in 10 minutes car will travel $= 1 \times 10 = 10$ kilometers.

9. A man walked 4 km in the morning in 50 minutes. There was some interruption during the walking for 10 minutes. What distance could not the cover during the interruption?

(a) 700 metres

(b) 800 metres

(c) 900 metres

(d) 1000 metres

(e) None of these

Answer: (b)

Explanation:

Distance travelled in 10 minutes $= \frac{4000}{50} \times 10 = 800$ metres.

❖ SUMMARY

- Unitary method is used to convert the quantity in single quantity.
- The given units can be converted into its lowest unit using unitary method.
- Two different units of a same quantity can be converted into a single unit.
- If the cost of an article is in rupees and paise then it is converted into either rupees or paise.
- If length of an object is given in meters and centimeters then for solving the measurement based problem meters and centimeters are converted into either metres or in centimeters.

❖ YOU MUST KNOW

- The word mathematics is derived from the Greek word mathema.
- Babylonians were developed the elementary algebra.
- Height of a pyramid using geometry was first calculated by great scientist Thales.

Questions:

1. **A car travels a distance of 20 km in 15 minutes, how much distance will it cover in one and half hour?**

   (a) 120 km

   (b) 130 km

   (c) 200 km

   (d) 300 km

   (e) None of these

   Answer: (a)

2. **There are 50 students in a class. If school administration spends Rs 80,000 for dresses then the total amount spent for dresses of 10 students is :**

(a) Rs 17,000

(b) Rs 16,000

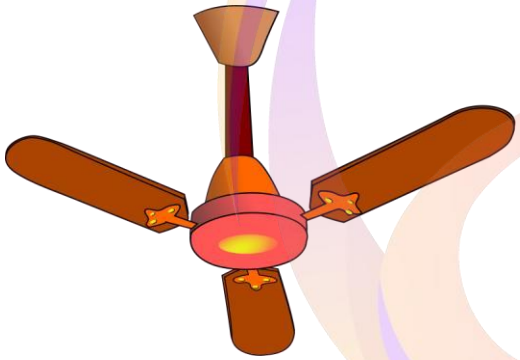
(c) Rs 18,000

(d) Rs 19,000

(e) None of these

Answer: (b)

3. **A fan rotates 110 times in 10 minutes. The rotation of fan in 1 minute is:**



(a) 10

(b) 12

(c) 11

(d) 30

(e) None of these

Answer: (c)

4. **The cost of 5 articles is Rs 290. What is the cost of 2 articles?**

(a) Rs 116

(b) Rs 157

(c) Rs 198

(d) Rs 197

(e) None of these

Answer: (a)

5. **The sum of three numbers is A. If the addends numbers are same then which one of the following options represents the value of each number?**

(a) 3A

(b) $\frac{A}{3}$

(c) $\frac{3}{A}$

(d) A + 3

(e) None of these

Answer: (b)

6. **Time shown by the clock is 10 hours 30 minutes. How many times does the minutes hand of watch rotate when the time is 2 hours 30 minutes?**

(a) 3

(b) 7

(c) 4

(d) 5

(e) None of these

Answer: (c)

7. **The length of a rope is 15 cm. How many ropes can be obtained on dividing each 2.5 cm of length from it?**

(a) 6

(b) 7

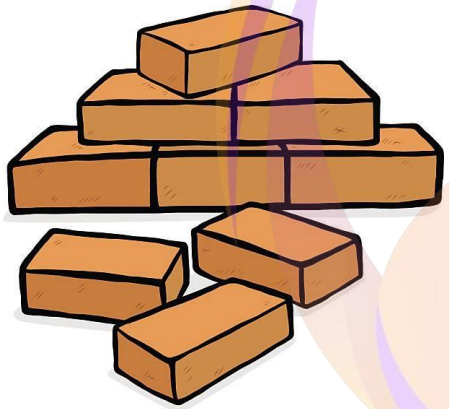
(c) 8

(d) 5

(e) None of these

Answer: (a)

8. **If 13 bricks weight 130 kg, what would 17 bricks weight?**



(a) 80 kg

(b) 170 kg

(c) 160 kg

(d) 175 kg

Answer: (b)

9. **There are 240 fishes in a pond and every fish has 80 baby fishes. If the cost of each baby fish is Rs 20 then what is the cost of total number of baby fishes in the pond?**

(a) Rs 385,000

(b) Rs 384,000

(c) Rs 648,000

(d) Rs 650,000

(e) None of these

Answer: (b)

10. If the perimeter of 5 same and equal figures is 65 cm, then what is the perimeter of each figure?

(a) 14 cm

(b) 13 cm

(c) 15 cm

(d) 11 cm

(e) None of these

Answer: (b)