

CCT TEST ITEM 1

Beautiful pattern:

Venkatesh has observed a beautiful pattern on the wall of a cricket stadium.



- i) He wants to know the number of boxes in the 7th row can you help him to find the same?
- ii) In the last row there are 23 boxes can you find the total number of rows on the wall?
- iii) Can you give the total number of boxes in the Pattern?
- iv) If the cost of painting one box is rupees 2. Find the total cost of painting the pattern.
- v) Can you give the formula for the cost of painting of 'n' such walls?

CCT TEST ITEM 2

Construction of a building:

Raman is a contractor; he is constructing a building with many floors. The building has an interesting design on each floor it has open space thus several rooms decrease as we go up. If several bricks for the construction of a room is 1500. The number of bricks required for the ground floor is 30,000 on the 1st floor it is 27,000 on the 2nd floor It is 24,000 and so on

- i) Find the total number of rooms on the ground floor.
- ii) Find the number of rooms on the 5th floor.
- iii) Find the maximum number of floors that can be built.
- iv) Find the total bricks required for the construction of maximum floors.
- v) Find the cost of bricks for the first three floors at the rate of Rs.10 per brick.

CCT TEST ITEM 3

Arrangement of Stones

Let there be $(2n+1)$ Stones placed at intervals of 10 m. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. That person carried the job with one of the end stones by carrying them in succession. In carrying all the stones, he covered a distance of 3 KM. let P be the middle stone and A, B be the end Stones on the left and right of P respectively. Suppose the man starts from A. He picks up the end stone on the left of the mid-stone and goes to the mid-stone, drops it, and goes to $(n-1)$ stone on the left, picks it up, goes to the mid-stone, and drops it. This process is repeated till he collects all stones on the left of the mid-stone at the mid-stone. Find

- (a) The distance covered in collecting stones on the left of the middle stones.
- (b) The distance covered in collecting the stones on the right side of the middle stone.
- (c) Find the value of n .
- (d) Find the number of stones.

CCT TEST ITEM 4

Money is needed for higher study.

Mr. Dinkar has just admitted his son Dipu to class I. Dipu is a very bright student and is doing well. His father belongs to the lower middle-income group so he has planned to save a certain amount of money every year in the name of higher studies of his son. Suppose Dipu never fails in any class and does not repeat in the same class. As per his plan, Dinkar will need an amount of Rs 5 lakhs for the higher studies of his son after completion of school $(10+2)$. So he started saving an amount of Rs 20,000 in the first year of his study and increased his yearly savings by Rs 5,000 each year. When Dipu passes his XII class, it will be his choice to decide about his studies.

- (i) What will be the amount of his savings for the year in which Dipu will be in class XII?
- (ii) Will Dinkar be able to have his gross savings sufficient for Dipu's higher study in the year in which Dipu will pass out Class XII?
- (iii) How much amount will be left with Dinkar if he pays 5 lakhs to Dipu for his higher study as per his plan?
- (iv) Dipu decided to go to abroad for further study so he needs Rs 9 lakhs. Dipu's father does not have that much amount of money. He thought about a per year increase in his savings. How much amount per year increase he should have been saving to create his total savings equal to Rs 9 lakhs in the year Dipu is in his class XII?

CCT TEST ITEM 5

Tour of Manali

Rinku and Pawan live in Delhi. They decided to go on a tour of hill station of Manali with family. Manali is 500 km far from Delhi. Rinku and Pawan started their journey at the same time from the same place. Rinku was driving his car at a uniform speed of 40 km per hour. Pawan is very new to driving so he decided to drive his car at the rate of 20 km per hour in the first hour and increased the speed by 5 km in each succeeding hour. On the return journey, they planned to stop at a Hotel after dividing 5 hours continuously and will take some refreshments. Again Rinku was driving his car at a uniform speed of 40 km per hour and Pawan started driving his car at the rate of 20 km per hour in the first hour and thought to increase his speed per hour as per Plan.

- (i) Will Pawan's car be able to overtake Rinku's car before reaching Shimla? Suppose they do not stop anywhere in their journey.
- (ii) How much time it will take Pawan to meet or overtake Rinku's car? Suppose they do not stop anywhere in their journey.
- (iii) At what distance from Delhi Pawan and Rinku will meet or overtake each other?
- (iv) On the return journey they planned to stop at a Hotel after 5 hours of journey and take some refreshments. So Rinku told Pawan that I would drive my car at a uniform speed of 40 km per hour but you have to increase your speed. Pawan started driving his car at the rate of 20 km per hour in the first hour. What should be the rate of increase in his speed so that they reach the hotel at the same time after 5 hours?

CCT TEST ITEM 6

DISTANCES BETWEEN PLANETS

The distances between planets will vary depending on where each planet is in its orbit around the Sun. Sometimes the distances will be closer and other times they will be farther away. The reason for this is that the planets have elliptical orbits and none of them are perfect circles. As an example, the distance between the planet Mercury and Earth can range from 77 million km at the closest point, to as far as 222 million km at the farthest. There is a huge amount of difference in the distances between the planets depending on their position on their orbit path.

The table below shows the average distance between Earth and different planets

1 AU (astronomical unit) is the distance from the Sun to Earth, which is 149,600,000 km.

PLANET DISTANCE TABLE-

FROM	TO	DISTANCES (IN km)
Earth	Mars	78,340,000
Earth	Jupiter	628,730,000
Earth	Saturn	1,275,000,000
Earth	Uranus	2,723,950,000
Earth	Neptune	4,351,400,000
Earth	Venus	41,400,000
Earth	Mercury	91,691,000

Read the Table given above and answer the following question.

- The distance between Earth and Mercury is 91,691,000 km. Convert this distance in AU and write this in standard form.
- 1 AU is equal to 149,600,000 km. Convert it to standard form.
- A planet is 1.275×10^9 km far from the Earth. Name the planet.
- Which planet is nearest to the Earth? Write the distance of the nearest planet in meters and convert it into standard form.