Class: VIII   **Subject: Maths**

Topic: Area of Trapezium and Polygon, Surface Area and Volume

 Read the instructions carefully and answer the following questions.

Assertion and Reason Based Questions
In the following questions, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a),(b),(c) and (d)as given below.
 (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
 (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
 (c) (A) is true but (R) is false
 (d) (A) is false but (R) is true.

1) **Assertion (A)** –The area of a trapezium is calculated as $\frac{1}{2} \times (a + b) \times h$, where a and b
   are the lengths of the parallel sides and h is the height.
   Reasons (R) –The area of a trapezium depends only on the height and the length of the
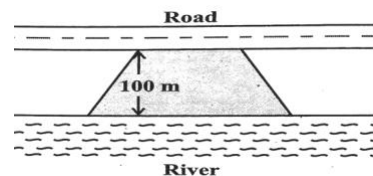   non parallel sides.

2) **Assertion (A)** – The volume of a sphere is $\frac{4}{3}\pi r^3$, where r is the radius of this sphere.
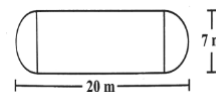   **Reasons (R)** – A sphere is a three-dimensional figure with no edges or vertices.

3). **Assertion (A)** – The lateral surface area of a cuboid is $2h(l + b)$ where l, b and h are the
                   dimensions of the cuboid.
   Reasons (R) – The lateral surface area includes the areas of the top and bottom faces of
                   the cuboid.

4. Mohan wants to buy a trapezium shaped field. Its side along the river
   is parallel and twice the side along the road. If the area of this field is
   $10500 m^2$ and the perpendicular distance between the two parallel sides
   is $100m$, find the length of the side along the river.

5. How many bricks of size $22cm \times 10cm \times 7cm$ are required to construct a wall $11m$ long,
   $3.5m$ high and $40cm$ thick, if the cement and sand used in the construction occupy (1/10)th
   part of the wall?

6. Four horses are tethered with equal ropes at 4 corners of a square field of side $70m$ so that
   they just can reach one another. Find the area left ungrazed by the horses.

7. The shape of a garden is rectangular in the middle and semi circular at the ends
   as shown in the diagram find the area and the perimeter of the garden.

8. **Case Study Based Question**
   A water tank is shaped like a cuboid with a length of $8m$, a breadth of $6m$ and a height of
$3m$. It is used to store water for a housing society. The housing society decides to paint the

exterior of the tank to prevent rusting. They also wish to calculate the amount of water the tank can hold when filled to its full capacity.

Further, they plan to install a cylindrical water pipe of radius $7cm$ and height $2.1m$ to supply water to the houses. The pipe is also to be painted.

  Choose the correct answers:

(i)   Calculate the total surface area of a cuboidal water tank (excluding the base) to be painted.

   a) $132m^2$ b) $180m^2$ c) $156m^2$ d) $150m^2$

(ii)   How much water the tank can hold in litres.

   a) 1440   b) 14400   c) 144000   d) None of these

(iii)   Find the volume of the cylindrical water pipe.

   a) $323m^3$ b) $0.0323m^3$ c) $3.23m^3$ d) $0.923m^3$