Short Answer Type Questions – I

[2MARKS]

State whether the following statements are True of False. Justify your answers

Que 1. The Euclidean geometry is valid only for figures in the plane.

Que 2. If area of a triangle equals the area of a square and the area of the square equals that of a rectangle, then the area of the triangle also equals the area of the rectangle.

Que 3. The statements that are proved are called axioms.

Que 4. Euclid's fourth axiom says that everything equals itself.

Que 5. The edges of a surface are curves.

Que 6. Two distinct intersecting lines cannot be parallel to the same line.

Que 7. In geometry, we take a point, a line and a plane as undefined terms.

Que 8. The things which are double of the same thing are equal to one another.

Que 9. The boundaries of the solids are curves.

Que 10. Attempt to prove Euclid's fifth postulate, using the other postulates and axioms, led to the discovery of several other geometries.

Sol. 1. True, it fails on the curved surfaces. For example, on curved surfaces, the sum of angles of a triangle may be more than 180^0.

2. True, things equal to the same thing are equal.

3. False, statements that are proved are theorems.

4. True, as it is the justification of the principle of super position.

5. False, the edges of the surfaces are line.

6. True, it is an equivalent version of Euclid's fifth postulate.

7. True, to define a point, a line and a plane in geometry we need to define many other things that give a long chain of definitions without an end. Due to these reasons, mathematicians agree to leave these geometric terms undefined.

8. True, one of the Euclid's axioms.

9. False, as boundaries of the solids are surfaces.

10. True, as these geometries are different from Euclidean geometry.

Que 11. If P, Q and R are three points on a line and Q is between P and R, then prove that $PR - QR = PQ$.

Sol.

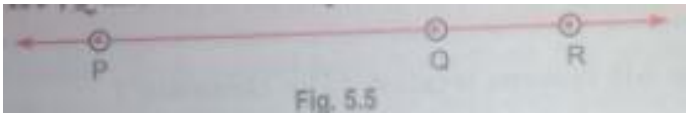

Fig. 5.5

In the above figure PQ coincides with $PR - QR$.

So, according to axiom, “things” which coincide with one another are equal to ‘one another’. We have,

$$PR - QR = PQ$$

Que 12. Solve the equation $u - 5 = 15$ and state the axiom that you use here.

Sol. $u - 5 = 15$

On adding 5 to both sides, we have

$u - 5 + 5 = 15 + 5$

Euclid’s second axiom, when equals are added to equals, the wholes are equal.
Or

$u = 20$