

**BCM SCHOOL, BASANT AVENUE, DUGRI, LUDHIANA.**  
**OCTOBER ASSIGNMENT**  
**CLASS- X (MATHEMATICS)**  
**TOPICS: TRIANGLES & SURFACE AREA AND VOLUME.**

**SECTION –A (MULTIPLE CHOICE QUESTIONS)**

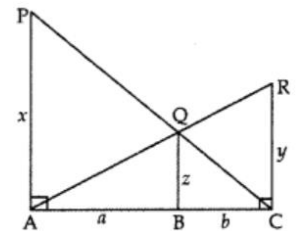
1. If in two triangles ABC and DEF,  $AB/DF=BC/FE=CA/ED$ , then  
 (a)  $\triangle ABC \sim \triangle DEF$  (b)  $\triangle ABC \sim \triangle EDF$   
 (c)  $\triangle ABC \sim \triangle EFD$  (d)  $\triangle ABC \sim \triangle DFE$
2. If in triangles ABC and DEF,  $AB/DE=BC/FD$ , then they will be similar, if  
 (a)  $\angle B = \angle E$  (b)  $\angle B = \angle D$  (c)  $\angle A = \angle D$  (d)  $\angle A = \angle F$
3. A solid cylinder of radius r and height h is placed over other cylinder of same height and radius. The total surface area of the shape so formed is:  
 (a)  $4\pi rh + 4\pi r^2$  (b)  $4\pi rh - 4\pi r^2$  (c)  $4\pi rh + 2\pi r^2$  (d)  $4\pi rh - 2\pi r^2$

**SECTION B( 2 MARKS QUESTIONS)**

4. In  $\triangle ABC$ , D and E are the points on the sides AB and AC respectively such that  $DE \parallel BC$ . If  $AD = 6x - 7$ ,  $DB = 4x - 3$ ,  $AE = 3x - 3$ , and  $EC = 2x - 1$  then find the value of 'x'.
5. A cone of maximum size is curved out from a cube of edge 14 cm. Find the surface area of the remaining solid after the cone is curved out.

**SECTION – C (3 MARKS QUESTIONS)**

6. The  $\frac{3}{4}$  th part of a conical vessel of internal radius 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height of water in cylindrical vessel.
7. In the given fig. PA, QB and RC each is perpendicular to AC such that  $PA = x$ ,  $RC = y$ ,  $QB = z$ ,  $AB = a$  and  $BC = b$ . Prove that  $1/x+1/y=1/z$ .



**SECTION – D (5 MARKS QUESTIONS)**

8. M is mid-point of side CD of a parallelogram ABCD. The line BM is drawn intersecting AC at L and AD produced at E. Prove that  $EL = 2BL$ .
9. A vessel in shape of an inverted cone is surmounted by a cylinder has a common radius of 7 cm. It was filled with liquid till it covered one third the height of the cylinder. If the height of each part is 9 cm and the vessel is turned upside down. Find the volume of the liquid and to what height will it reach in the cylindrical part.

**SECTION – E (CASE STUDY)**

10. The boiler is essentially a closed vessel inside which water is stored. Fuel (generally coal) is burnt in a furnace and hot gasses are produced. These hot gasses come in contact with water vessel where the heat of these hot gasses transfer to the water and consequently steam is produced in the boiler. Then this steam is piped to the turbine of thermal power plant. There are many different types of boiler utilized for different purposes like running a production unit, sanitizing some area, sterilizing



equipment, to warm up the surroundings etc. Rajesh has been given the task of designing a boiler for NTPC. Boiler consist of a cylindrical part in middle and two hemispherical part its both end. The cross section of boiler is given below. Length of cylindrical part is the 3 times of radius of hemispherical part.

- a) Determine the total surface area of boiler.
- b) What is the capacity of boiler?
- c) Calculate the ratio of surface area and volume of boiler.