

# INTERSECTION OF SURFACES 14

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## 14-1 INTRODUCTION

When a solid penetrates into another solid, it is known as interpenetration of solids. Due to such interpenetration their lateral surfaces intersect to produce closed loop which may either be made of straight lines or curves. These loops are known as lines or curves of intersection.

Since two plane surfaces intersect in a straight line the intersection of prism with prism or pyramid with pyramid or prism with pyramid results in a polygon. Similarly if any one or both of the two solids have curved surface, it will result in a closed curve. In both the cases, the term "curve of intersection" is frequently used. It is important to note that the points lying on the curve of intersection are always common to the surfaces of both the solids.

## MULTIPLE CHOICE QUESTIONS

Choose the most appropriate answer out of the given alternatives:

- i) When two prisms intersect at right angle, the curve of intersection is made up of  
(a) Circular arc    (b) Elliptical arc    (c) Curved line    (d) Straight line
- ii) When two cylinders of equal diameters envelope a common sphere, the curve of intersection is made up of  
(a) Parabola    (b) Semicircle    (c) Straight line    (d) None of these
- iii) The line of intersection between cylinder and cone, **unless** they envelope a common sphere, is made up of  
(a) Straight line    (b) Curved line    (c) Circular arcs    (d) Parabolic curve
- iv) Which of the following method is **not** used for obtaining curves of intersection?  
(a) Line method    (b) Curve method  
(c) Generator method    (d) Cutting plane method
- v) The study of intersection of surfaces helps in  
(a) Sheet metal work    (b) Building drawing  
(c) Architectural drawing    (d) All of these

- vi) The intersection of a cone by a plane results in  
 (a) Conic section (b) Cycloid (c) Helix (d) None of these
- vii) The curve of intersection of any solid with a line is  
 (a) A point (b) A Line (c) A closed loop (d) None of these
- viii) When a cylinder penetrates into a vertical cone with their axes parallel to each other, the top view of the curve of intersection is  
 (a) A Circle (b) An Ellipse (c) A parabola (d) A cycloid
- ix) When a vertical cylinder is penetrated by a horizontal cylinder, the top view of the curve of intersection is  
 (a) Circular arc (b) Elliptical arc (c) Closed loop (d) None of these
- x) A cone resting on its base in the HP is penetrated by a horizontal cylinder. The top view of the curve of intersection results in  
 (a) Circular arc (b) Elliptical arc (c) Closed loop (d) None of these
- xi) The curve of intersection of a vertical cylinder with an auxiliary vertical plane is  
 (a) A point (b) A straight line (c) A curved line (d) A closed loop
- xii) The curve of intersection of a vertical cone with an auxiliary vertical plane is  
 (a) Straight line (b) Elliptical curve (c) Parabolic curve (d) Hyperbolic curve
- xiii) The points at which the curve of intersection changes its nature are known as  
 (a) Arbitrary points (b) Key points (c) Crucial points (d) Intersection points

Answer: (i) d (ii) c (iii) b (iv) b (v) a (vi) a (vii) a (viii) a (ix) a (x) c (xi) b (xii) d (xiii) b