

## BASIC SURFACES FOR ENGINEERING



*Figure 00. Main stairs of Engineering School of Bilbao II. Picture made by the authors, 2018.*

### 1. Test of Surfaces: Basic concepts

## Instructions

The questions presented are multiple choice questions, with only one correct answer.

The solutions are at the end of the document.

## Surfaces. Basic concepts test

Which of the following statements is correct:

1. Regarding the concept of surface and body:
  - a. Surface is the body formed by generatrices, while the body can also be formed by meridians and parallels.
  - b. Surface and body are equivalent concepts, with the only difference that the body has a lower base.
  - c. The surface is not thick and can be unlimited, while the body has a limited extension and therefore a volume.
  - d. Body means various surfaces in different arrangements.
  
2. Regarding the generation of ruled surfaces:
  - a. They are formed by lines that rotate supported on a vertex.
  - b. They are generated by lines, called generatrix, that move in space according to a law of motion.
  - c. They are non-curved surfaces.
  - d. They are generated by a line, called guideline, that moves in space according to a law of motion.
  
3. Regarding radiated surfaces:
  - a. The sphere is a radiated surface, and therefore, we can limit its radius.
  - b. The sphere is a radiated surface, although we narrow its diameter.
  - c. The sphere is not a radiated surface, because it does not have generatrix that pass through the center.
  - d. The sphere is not a radiated surface, because its generatrix does not pass through a fixed point.
  
4. Regarding ruled surfaces:
  - a. The sphere is a ruled surface, and therefore, we can limit it.
  - b. The sphere is not a ruled surface, because it has no linear dimensions.
  - c. The sphere is not a ruled surface, because its generatrix is not a straight line.
  - d. The sphere is not a ruled surface, because its guideline is not a straight line.

5. On surfaces, when the general basic surface is delimited by cutting planes, it is called:
  - a. Section.
  - b. Trunk.
  - c. Volume.
  - d. Intersecting surface.
  
6. The sphere:
  - a. It is a surface of simple curvature, which is obtained by revolution.
  - b. It is a double curvature surface, which is obtained by revolution.
  - c. It is a double curvature surface, obtained by revolution with respect to two axes.
  - d. It is a triple curvature surface, which is obtained by revolution.
  
7. An irregular straight prism:
  - a. The height forms an angle with the base, giving rise to generatrix of different length.
  - b. The axis forms any angle, and the base has edges of different lengths.
  - c. The axis and height are not parallel.
  - d. The axis is perpendicular to the base, and the base has edges of different lengths.
  
8. An oblique cylinder not of revolution:
  - a. The height does not rotate about the axis, and forms an angle with the base.
  - b. It is generated by an equidistant rotation of the generatrix with respect to the axis, but less than  $360^\circ$ .
  - c. The rotation about its axis of symmetry is erratic.
  - d. The generatrix does not rotate with respect to the axis, which forms an angle with the base.

9. An oblique cylinder with a circular base resting on the horizontal plane of projection:
- It is a cylinder of revolution.
  - It is not a cylinder of revolution.
  - It will be revolution or not revolution depending on the angle of the axis with respect to the base.
  - With a circular base it is always of revolution.
10. A straight cone with a circular base resting on the vertical plane of projection:
- The axis does not pass through the center of the base.
  - The height passes through the center of the base, but only in the vertical projection plane.
  - It is not of revolution.
  - Their generatrices are tangent to the base in the horizontal projection.

## Solutions for surfaces basic concepts testing

1c, 2b, 3d, 4c, 5b, 6b, 7d, 8d, 9b, 10d