1. Which testing method involves applying a pulling force to a material until it breaks?

a) Tensile test
b) Compression test
c) Shear test
d) Bend test

Answer: a) Tensile test
Explanation: In a tensile test, a material specimen is subjected to a gradually increasing pulling force until it fractures. This test helps determine the material's mechanical properties such as yield strength, ultimate tensile strength, and elongation.

2. Which test is used to evaluate a material's resistance to being squeezed or crushed?

a) Tensile test
b) Compression test
c) Shear test
d) Bend test

Answer: b) Compression test
Explanation: Compression testing involves applying a compressive force to a material specimen to assess its compressive strength and deformation behavior under load.

3. In which test is a material subjected to a force that causes it to slide in opposite directions along parallel planes?

a) Tensile test
b) Compression test

c) Shear test
d) Bend test

Answer: c) Shear test
Explanation: Shear testing evaluates a material's shear strength and deformation characteristics when subjected to forces acting parallel to the plane of the material.

4. Which test assesses a material's ability to withstand bending or flexing without breaking?

a) Tensile test
b) Compression test
c) Shear test
d) Bend test

Answer: d) Bend test
Explanation: Bend testing involves applying a bending force to a material specimen to determine its flexibility, ductility, and resistance to fracture under bending loads.

5. What type of test measures a material's resistance to indentation or scratching?

a) Tensile test
b) Compression test
c) Hardness test
d) Bend test

Answer: c) Hardness test
Explanation: Hardness tests assess a material's resistance to deformation, indentation, or scratching, providing information about its strength and wear resistance.

6. Which test evaluates a material’s ability to absorb energy under sudden impact?

a) Tensile test
b) Compression test
c) Impact test
d) Bend test

Answer: c) Impact test
Explanation: Impact testing involves subjecting a material specimen to a sudden force or impact to measure its toughness and ability to withstand sudden loading conditions.

7. What type of test examines a material’s endurance limit under repeated loading cycles?

a) Tensile test
b) Compression test
c) Fatigue test
d) Bend test

Answer: c) Fatigue test
Explanation: Fatigue testing assesses a material’s fatigue strength by subjecting it to repeated loading cycles to simulate real-world conditions and determine its endurance limit.

8. Which test measures a material’s ability to be hardened by heat treatment?

a) Tensile test
b) Compression test
c) Hardenability test
d) Bend test

Answer: c) Hardenability test
Explanation: Hardenability testing evaluates a material's capacity to be hardened by heat treatment processes such as quenching, providing insights into its suitability for specific applications.

9. What analysis is conducted to determine the cause of a material's fracture?

a) Tensile analysis
b) Compression analysis
c) Shear analysis
d) Fracture analysis

Answer: d) Fracture analysis
Explanation: Fracture analysis investigates the characteristics and circumstances surrounding a material's fracture to determine the causes, which can include factors such as material defects, loading conditions, and environmental factors.

10. Which method is NOT a non-destructive testing (NDT) technique?

a) Ultrasonic testing
b) Radiographic testing
c) Tensile testing
d) Magnetic particle testing

Answer: c) Tensile testing
Explanation: Tensile testing is a destructive testing method where the material specimen is subjected to failure to assess its mechanical properties.

11. Which NDT method utilizes sound waves to detect internal flaws in materials?

a) Ultrasonic testing
b) Radiographic testing
c) Eddy current testing
d) Magnetic particle testing

Answer: a) Ultrasonic testing
Explanation: Ultrasonic testing involves sending high-frequency sound waves through a material to detect internal defects or discontinuities based on the reflections or changes in the sound wave pattern.

12. What property is typically evaluated using a Rockwell hardness test?

a) Elastic modulus
b) Yield strength
c) Surface hardness
d) Toughness

Answer: c) Surface hardness
Explanation: The Rockwell hardness test measures the indentation hardness of a material's surface, providing information about its resistance to indentation or scratching.

13. Which material property is NOT typically evaluated in a Charpy impact test?

a) Ductility
b) Toughness
c) Brittleness

d) Hardness

Answer: d) Hardness
Explanation: The Charpy impact test primarily assesses a material's toughness by measuring the energy absorbed by a specimen when it fractures under a standard impact load.

14. What type of material property is determined using a Brinell hardness test?

a) Elastic modulus
b) Yield strength
c) Surface hardness
d) Ductility

Answer: c) Surface hardness
Explanation: The Brinell hardness test evaluates a material's resistance to indentation by measuring the diameter of the impression left by a hardened steel or carbide ball under a known load.

15. Which alloying element is commonly added to steel to improve corrosion resistance?

a) Aluminium
b) Copper
c) Manganese
d) Chromium

Answer: d) Chromium
Explanation: Chromium is often added to steel to form a passive oxide layer on its surface, enhancing its corrosion resistance properties.

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