

Grade 7

Unit D Structures and Forces Unit Exam

1. What is the proper term for a structure's ability to maintain its position?
 - a. structural maintenance
 - b. structural stability
 - c. structural classification
 - d. structural strength
2. Three basic structural forms are
 - a. solid, hollow and frame
 - b. shell, bridged and frame
 - c. frame, solid and shell
 - d. cupped, solid and outline
3. The following structure shown below can be seen in many locations now but was primarily used in the northern regions as a sign post. It is made by placing rocks on top of one another in the fashion shown. It is called an Inukshuk.

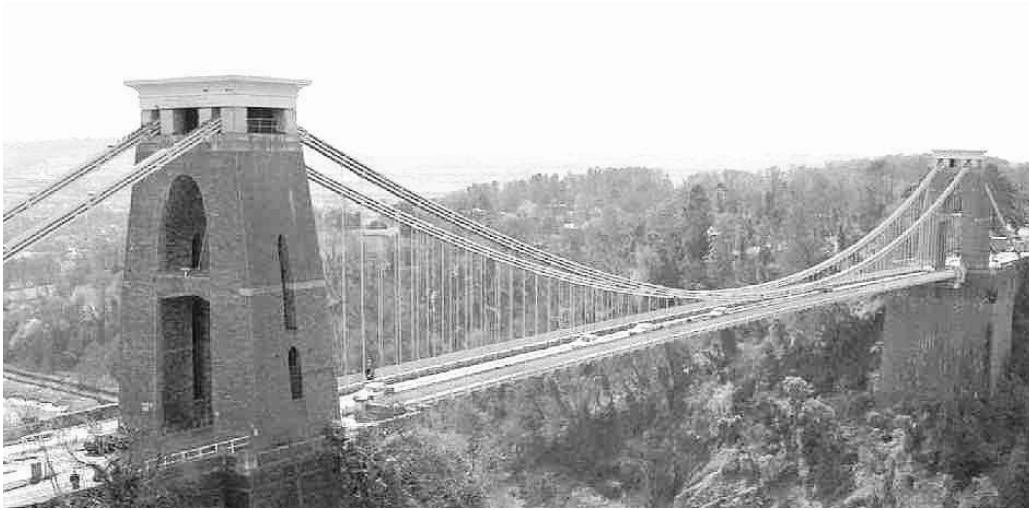
An Inukshuk is an example of what kind of structure?

- a. shell structures
- b. solid structures
- c. dome structures
- d. combination structures



4. The most common types of bridges are
 - a. beam, truss, arch, suspension
 - b. beam, arch, suspension, support
 - c. suspension, arch, truss, railway
 - d. truss, arch, cable, suspension

5. The Clifton Bridge as seen below is located in Bristol, England.



What type of bridge is the Clifton bridge?

- a. beam
- b. arch
- c. cable
- d. suspension

6. This bridge pictured below is commonly seen through out North America.



This type of bridge is called a

- a. beam
- b. arch
- c. truss
- d. support

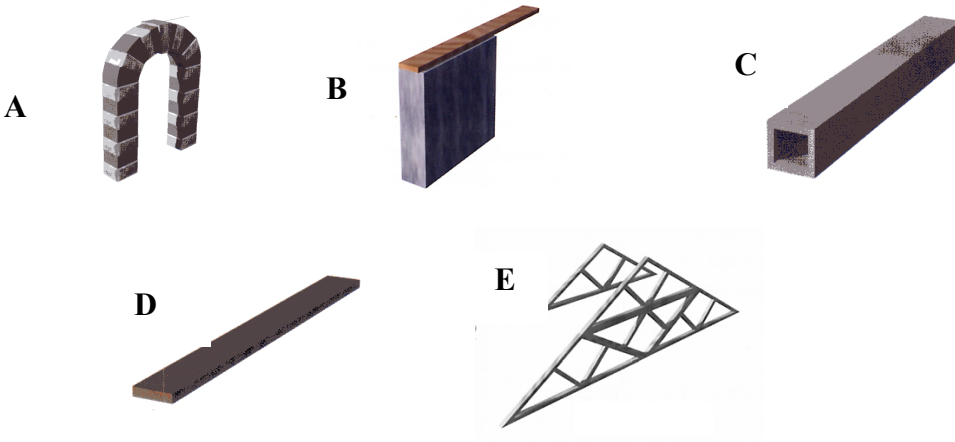
7. A framework of beams joined as interlocking triangles is known as what?
 - a. I-beam
 - b. cantilever
 - c. truss
 - d. girder
8. The force required to hold a 1-kg book is about
 - a. 1.0 N
 - b. 10 N
 - c. 100N
 - d. 1000N
9. The actual effect of a force on a structure depends on
 - a. the magnitude, or size of the force
 - b. the direction of the force
 - c. the location where the force was applied
 - d. all of the above
10. The balanced arrangement of mass that occurs on opposite sides of a line or plane is known as
 - a. centre of gravity
 - b. symmetry
 - c. dynamic load
 - d. external load force
11. The term "load" refers to
 - a. an external force on a structure
 - b. a balanced arrangement of mass
 - c. the necessary resistance of a structure
 - d. a realistic design of a structure's forces
12. The weight of a structure and the non-moving load it supports is called
 - a. a dynamic load
 - b. a mass load
 - c. a static load
 - d. a load weight
13. Three internal forces that are classified by the direction in which they act are
 - a. compression, tension, and exertion
 - b. tension, compression, and shear
 - c. shear, exertion, and stress
 - d. curvature, twisting, and bending
14. Complementary forces are those in which
 - a. bending occurs after the structure is immobile
 - b. mobility is hampered by inconsistent movement
 - c. different forces act on a structure at the same time
 - d. a quick succession of movements follow repeatedly

15. The strongest structural shape is
- rectangular
 - arched
 - square
 - triangular
16. The term deformation refers to
- the ability of a material to bend under force without breaking
 - the change of shape in a structure because the material is unable to resist the load acting on it
 - the drag or resistance felt when a load is placed on a moveable structure
 - the change of shape in a structure when the material absorbs the force acting on it
17. In testing a material for brittleness, one is testing
- how easily the material breaks.
 - how easily the material can be stretched thin into a wire.
 - what the texture of the material is.
 - how easily the material can be recycled.
18. The place at which structural parts are joined is called a
- fastener
 - friction fit
 - joint
 - interlock
19. The force that results when a surface of one object moves against the surface of another is referred to as
- resistance
 - gravity
 - stress
 - friction
20. Which of the following is used to bond materials together?
- nails
 - screws
 - glue
 - rivets
21. Fixed joints are rigid to prevent any
- movement
 - strength
 - elasticity
 - all of the above

22. Which of the following terms refers to terrain conditions?
- a. heavy snow
 - b. high humidity
 - c. shifting soil
 - d. earthquake risk
23. Evaluating the safety of a structure can be done by monitoring
- a. environmental conditions
 - b. how frequently a structure fails and why
 - c. what forces are acting on it
 - d. what the maintenance costs will be after it is completed
24. Building on permafrost can be challenging because
- a. the permafrost is located in northern Canada
 - b. upper portions of the permafrost make the ground spongy
 - c. technology cannot solve the problems
 - d. it is unusual for foundations built on this to have structural stress
25. Structural safety is affected by environmental factors such as
- a. soil stability, material failure, overcrowding
 - b. climate, building components, terrain
 - c. earthquakes, hurricanes, tornados
 - d. terrain, climatic conditions, earthquake risk
26. The process of forming a material into wave-like ridges or folds is known as
- a. corrugation
 - b. lamination
 - c. reinforcing
 - d. alteration
27. The function of a structure refers to its use or purpose.
- a. True
 - b. False
28. Some of the main reasons that structures differ around the world are climate, culture, tradition, technology, and economics.
- a. True
 - b. False
29. A force is a push or pull that tends to cause an object to change movement or shape.
- a. True
 - b. False
30. The standard unit for measuring force is called mass.
- a. True
 - b. False

31. An external force is a force that is applied on a structure by something else.
a. True
b. False
32. When you tear a piece of paper, you are applying a compression force.
a. True
b. False
33. Friction is reduced on the ends of bones by tendons.
a. True
b. False

Look at the following pictures to answer **the next 3 questions**.



34. The arch is the structural component labeled
a. A
b. B
c. C
d. D
35. The box beam is the structural component labeled
a. A
b. B
c. C
d. D
36. The cantilever is the structural component labeled
a. A
b. B
c. C
d. D

37. The standard unit for measuring force is the

- a. Joule
- b. gram
- c. Newton
- d. Mass

38. The amount of matter in an object is referred to as its

- a. grams
- b. weight
- c. force
- d. mass

39. The center of gravity is best explained as

- a. the balanced arrangement of mass
- b. the imaginary point upon where the downward force of gravity acts
- c. the symmetrical arrangement that occurs on opposite sides of a line
- d. the center of an axis

40. The conditions that a structure must meet after it is built are referred to as

- a. performance requirements
- b. safety and efficiency standards
- c. maximum weight
- d. structural efficiency

41. People made homes of sod long ago because

- a. the material was easy to get
- b. the cost was very low
- c. it created an enclosure that could be heated by fire
- d. all of the above

42. The margin of safety refers to

- a. the speed limits on highways
- b. the safety features in designing buildings
- c. the acceptable limits of a structure's safety
- d. safe building components and materials

43. Strengthening materials through lamination and corrugation is

- a. taking some properties of each process
- b. a new technological advance
- c. combining materials and components in new arrangements
- d. a carefully developed technique

44. In evaluating designs from an overall perspective, considerations are made with regards to

- a. cost and the impact on the environment
- b. safety, benefits, and aesthetics
- c. impact on the environment, safety, cost, and benefits
- d. cost, structural stability, and environmental impacts

45. The materials used in structures can be evaluated according to many properties such as

- a. joints, weight bearing, aesthetics
- b. resistance to heat, resistance to water, resistance to moisture
- c. ductility, compression, brittleness
- d. none of the above

46. The external force that moves or changes with time is known as

- a. a static load
- b. a gravitational shift
- c. structural variance
- d. a dynamic load

47. Two essential characteristics of effective structures are

- a. to stay warm and dry
- b. to remain stable and be mobile
- c. to provide protection and remain stable
- d. to provide protection and security