1. Which structural system is characterized by interconnected beams and columns, providing support and stability to buildings?

a) Truss
b) Frame
c) Gantry Girder
d) Purlin

Answer: b) Frame

Explanation: Frames consist of interconnected beams and columns that resist vertical and lateral loads, providing support and stability to structures. They are commonly used in buildings and bridges.

2. What type of structural system is composed of multiple frames stacked on top of each other to form a tall building?

a) Multistory truss
b) Gantry Girder
c) Multistory frame
d) Purlin system

Answer: c) Multistory frame

Explanation: Multistory frames are used in tall buildings where multiple frames are stacked on top of each other to support the structure vertically and resist lateral loads.

3. Which of the following is NOT a type of truss commonly used in structural engineering?

a) Pratt truss
b) Warren truss
c) Purlin truss
d) Howe truss

Answer: c) Purlin truss

Explanation: Purlin truss is not a common type of truss used in structural engineering. Purlins are structural elements used to support the roof covering, while trusses are frameworks of beams used to support loads over a span.

4. What is the primary function of purlins in a roof truss system?

a) To provide lateral stability
b) To resist wind loads
c) To support the roof covering
d) To distribute vertical loads

Answer: c) To support the roof covering

Explanation: Purlins are horizontal structural members that support the roof covering materials such as metal sheets, tiles, or panels. They are placed perpendicular to the roof trusses and distribute the weight of the roof covering.

5. How do wind loads affect purlins and trusses in a building structure?

a) By increasing their tensile strength
b) By inducing lateral displacement

c) By reducing their bending moment
d) By decreasing their compressive strength

Answer: b) By inducing lateral displacement

Explanation: Wind loads exert lateral forces on the building structure, causing lateral displacement. Purlins and trusses must be designed to resist these lateral forces to maintain the stability and integrity of the building.

6. Which of the following is NOT a type of bracing system commonly used in structural design?

a) Diagonal bracing
b) Cross bracing
c) Lateral bracing
d) Portal bracing

Answer: c) Lateral bracing

Explanation: While lateral bracing is essential for structural stability, it is not commonly referred to as a distinct type of bracing system. Diagonal bracing, cross bracing, and portal bracing are more commonly recognized types.

7. In structural engineering, what is the primary purpose of a gantry girder?

a) To support overhead cranes
b) To provide lateral stability to buildings
c) To resist vertical loads in bridges

d) To support roof trusses

Answer: a) To support overhead cranes

Explanation: Gantry girders are designed to support overhead cranes or similar equipment. They are commonly used in industrial settings such as warehouses, shipyards, and factories.

8. Which factor primarily influences the design of a gantry girder?

a) Wind loads
b) Crane loads
c) Snow loads
d) Dead loads

Answer: b) Crane loads

Explanation: The design of a gantry girder is primarily influenced by the loads exerted by the overhead crane or lifting equipment it supports. These loads include vertical, horizontal, and dynamic forces.

9. Which of the following is a characteristic feature of a Pratt truss?

a) Diagonal members sloping upwards towards the center
b) Diagonal members sloping downwards towards the center
c) Horizontal top chord
d) Vertical members connecting top and bottom chords

Answer: a) Diagonal members sloping upwards towards the center

Explanation: Pratt trusses are characterized by diagonal members that slope upwards towards the center of the truss. This design helps to efficiently transfer loads and provide structural stability.

10. What structural element is commonly used to connect two or more trusses together to enhance stability?

a) Bracing
b) Purlin
c) Gantry girder
d) Diaphragm

Answer: a) Bracing

Explanation: Bracing elements are used to connect two or more trusses together to enhance stability and resist lateral forces such as wind loads. They help distribute loads evenly across the truss system.

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