



Department of Civil Engineering

CE8601- DESIGN OF STEEL STRUCTURAL ELEMENTS

Unit III- MCQ Bank

1. The strength of tensile members is not influenced by :

- a) length of connection
- b) net area of cross section
- c) type of fabrication
- d) length of plate**

Ans d) length of plate

2. Which of the following statement is correct?

- a) single angle section with bolted connection produce eccentricity about both planes**
- b) single angle section with bolted connection produce eccentricity about one plane only
- c) single angle section with welded connection produce eccentricity about both planes
- d) single angle section with welded connection does not produce eccentricity about one plane

Ans a) single angle section with bolted connection produce eccentricity about both planes

3. Which of the following statement is correct?

- a) Single angle members are used where members are subjected to reversal of stresses
- b) Double angle members are used in towers
- c) Single angle members are used as web members in trusses**
- d) Double angle members are used as web members in trusses

Ans c) Single angle members are used as web members in trusses

4. What is the difference between strand and wire rope?

- a) Strand consists of individual wires wound helically around a central core, wire rope is made of several strand laid helically around a core**
- b) Wire rope consists of individual wires wound helically around a central core, strand is made of several wire ropes laid helically around a core
- c) Strand consists of individual wires wound straight around a central core, wire rope is made of several strand laid helically around a core

d) Wire rope consists of individual wires wound straight around a central core, strand is made of several wire ropes laid helically around a core

Ans a) Strand consists of individual wires wound helically around a central core, wire rope is made of several strand laid helically around a core

5. Which of the following statement is not correct?

- a) Cables in form of wires ropes and strands are used in application where high strength is required
- b) Cables are generally long and their flexural rigidity is negligible
- c) They are flexible

d) They are recommended in bracing systems

Ans d) They are recommended in bracing systems

6. Bars and rods are not used as :

- a) tension members in bracing systems
- b) friction resistant members**
- c) sag rods to support purlin
- d) to support girts in industrial buildings

Ans b) friction resistant members

7. Sagging of members by built up bars and rods may be minimised by

- a) increasing length diameter
- b) increasing thickness ratio
- c) fabricating rod/bar short of its required theoretical length**
- d) fabricating rod/bar more than its required theoretical length

Ans c) fabricating rod/bar short of its required theoretical length

8. Which of the following statement is correct?

- a) angles placed on same side of gusset plate produce eccentricity about one plane only**
- b) angles placed on same side of gusset plate produce eccentricity about two planes
- c) angles placed on opposite side of gusset plate produce eccentricity about one plane only
- d) angles placed on opposite side of gusset plate produce eccentricity about two planes

Ans a) angles placed on same side of gusset plate produce eccentricity about one plane only

9. Which of the following is true about built up section?

- a) Built up members are less rigid than single rolled section
- b) Single rolled section are formed to meet required area which cannot be provided by built up members

- c) **Built up members can be made sufficiently stiff**
d) Built up sections are not desirable when stress reversal occurs

Ans c) Built up members can be made sufficiently stiff

10. What is slenderness ratio of a tension member?
a) ratio of its least radius of gyration to its unsupported length
b) ratio of its unsupported length to its least radius of gyration
c) ratio of its maximum radius of gyration to its unsupported length
d) ratio of its unsupported length to its maximum radius of gyration

Ans b) ratio of its unsupported length to its least radius of gyration

11. What is the maximum effective slenderness ratio for a tension member in which stress reversal occurs?
a) 180
b) 200
c) 280
d) 300

Ans a) 180

12. What is the maximum effective slenderness ratio for a member subjected to compressive forces resulting only from combination of wind/earthquake actions?
a) 180
b) 200
c) 340
d) 250

Ans d) 250

13. What is the maximum effective slenderness ratio for a member normally acting as a tie in roof truss or a bracing member?
a) 180
b) 200
c) 350
d) 400

Ans c) 350

14. The limits specified for slenderness ratio are not

- a) **applicable to cables**
- b) applicable to angle sections
- c) applicable to built-up sections
- d) applicable to circular sections

Ans a) applicable to cables

15. Which of the following statement is correct?

- a) stress and strain calculated using initial cross section area and initial gauge length are referred to as true stress and true strain
- b) stress and strain calculated using current cross section area and initial gauge length are referred to as true stress and engineering strain
- c) **stress and strain calculated using initial cross section area and initial gauge length are referred to as engineering stress and engineering strain**
- d) stress and strain calculated using current cross section area and gauge length are referred to as engineering stress and engineering strain

Ans c) stress and strain calculated using initial cross section area and initial gauge length are referred to as engineering stress and engineering strain

16. Arrange the regions of engineering stress-strain curve in order from right to left as in graph

- a) **strain softening region, strain hardening region, yield plateau, linear elastic region**
- b) strain hardening region, strain softening region, linear elastic region, yield plateau
- c) strain softening region, yield plateau, linear elastic region, strain hardening region
- d) strain hardening region, linear elastic region, yield plateau, strain softening region

Ans a) strain softening region, strain hardening region, yield plateau, linear elastic region

17. Which of the following is true regarding engineering stress-strain curve?

- a) it gives true indication of deformation characteristics of metal because it is entirely based on true dimensions of specimen
- b) **it does not give true indication of deformation characteristics of metal because it is entirely based on true dimensions of specimen**
- c) it gives true indication of deformation characteristics of metal because it is not entirely based on true dimensions of specimen
- d) it does not give true indication of deformation characteristics of metal because it is not entirely based on true dimensions of specimen

Ans b) it does not give true indication of deformation characteristics of metal because it is entirely based on true dimensions of specimen

18. What is the yield point for high strength steel?

- a) 0.5% of offset load
- b) 0.2% of offset load**
- c) 0.1% of offset load
- d) 1.5% of offset load

Ans b) 0.2% of offset load

19. True stress strain curve is also known as

- a) flow curve**
- b) un-flow curve
- c) elastic curve
- d) parabolic curve

Ans a) flow curve

20. Which of the following relation is correct?

- a) Net area = Gross area x deductions
- b) Net area = Gross area + deductions
- c) Net area = Gross area – deductions**
- d) Net area = Gross area / deductions

Ans c) Net area = Gross area – deductions

21. The design strength of tension member corresponding to net section rupture is given by :

- a) $A_n f_y \gamma_{m1}$
- b) $0.9 A_n f_y \gamma_{m1}$
- c) $0.9 A_n / f_y \gamma_{m1}$
- d) $0.9 A_n f_y / \gamma_{m1}$**

Ans d) $0.9 A_n f_y / \gamma_{m1}$

22. The block shear strength at an end connection for shear fracture and tension yield is given by :

- a) $(A_{vg} f_y / \sqrt{3} \gamma_{m0}) + (0.9 A_{tn} f_u / \gamma_{m1})$
- b) $(A_{tg} f_y / \gamma_{m0}) + (0.9 A_{vn} f_u / \sqrt{3} \gamma_{m1})$**
- c) $(0.9 A_{vg} f_y / \sqrt{3} \gamma_{m0}) + (A_{tn} f_u / \gamma_{m1})$
- d) $(0.9 A_{tg} f_y / \sqrt{3} \gamma_{m0}) + (A_{vn} f_u / \gamma_{m1})$

Ans b) $(A_{tg}f_y / \gamma_{m0}) + (0.9A_{vn}f_u / \sqrt{3} \gamma_{m1})$

23. The design tensile strength of tensile member is

- a) **minimum of strength due to gross yielding, net section rupture, block shear**
- b) maximum of strength due to gross yielding, net section rupture, block shear
- c) strength due to gross yielding
- d) strength due to block shear

Ans a) minimum of strength due to gross yielding, net section rupture, block shear

24. The block shear strength of connection is _____

- a) block shear strength at an end connection for shear fracture and tension yield
- b) block shear strength at an end connection for shear yield and tension fracture
- c) larger of block shear strength at an end connection for (shear fracture, tension yield) and (shear yield, tension fracture)
- d) **smaller of block shear strength at an end connection for (shear fracture, tension yield) and (shear yield, tension fracture)**

Ans d) smaller of block shear strength at an end connection for (shear fracture, tension yield) and (shear yield, tension fracture)

25. Which of the following is not true for angles as tension members?

- a) Angles if axially loaded through centroid can be designed as plates
- b) Angles connected to gusset plates by welding or bolting only through one of the two legs results in eccentric loading
- c) When load is applied by connecting only one leg of member, there is shear lag at the end connection
- d) **When angles are connected to gusset plates by welding or bolting only through one of the two legs resulting in eccentric loading, there is a uniform stress distribution over cross section.**

Ans d) When angles are connected to gusset plates by welding or bolting only through one of the two legs resulting in eccentric loading, there is a uniform stress distribution over cross section

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