



Department of Civil Engineering

CE8601- DESIGN OF STEEL STRUCTURAL ELEMENTS

Unit II - MCQ Bank

What is the yield strength of bolt of class 4.6?

- a) 400 N/mm²
- b) 240 N/mm²**
- c) 250 N/mm²
- d) 500 N/mm²

Ans b) 240 N/mm²

2. Which of the following is correct?

- a) size of hole = nominal diameter of fastener – clearances
- b) size of hole = nominal diameter of fastener x clearances
- c) size of hole = nominal diameter of fastener / clearances
- d) size of hole = nominal diameter of fastener + clearances**

Ans d) size of hole = nominal diameter of fastener + clearances

3. High strength bolt is used for _____

- a) shear connection
- b) slip resistant connection only
- c) bearing type connection only
- d) both slip resistant and bearing type connection**

Ans d) both slip resistant and bearing type connection

4. Which of the following is correct for pitch of the bolts and gauge?

- a) pitch is measured along direction of load, gauge is measured perpendicular to direction of load**
- b) pitch is measured perpendicular direction of load, gauge is measured along to direction of load
- c) pitch is measured along direction of load, gauge is measured along to direction of load
- d) pitch is measured perpendicular direction of load, gauge is measured perpendicular to direction of load

Ans a) pitch is measured along direction of load, gauge is measured perpendicular to direction of load

5. What is the minimum pitch distance?

- a) 2.0 x nominal diameter of fastener

- b) 3.0 x nominal diameter of fastener
- c) 1.5 x nominal diameter of fastener
- d) 2.5 x nominal diameter of fastener**

Ans d) 2.5 x nominal diameter of fastener

6. Maximum pitch distance = _____

- a) 16 x thickness of thinner plate
- b) 32 x thickness of thinner plate**
- c) 40 x thickness of thinner plate
- d) 20 x thickness of thinner plate

Ans b) 32 x thickness of thinner plate

7. In case of staggered pitch, pitch may be increased by _____

- a) 50%**
- b) 20%
- c) 100%
- d) 30%

Ans a) 50%

8. What is the difference between end and edge distance?

- a) Edge distance is measured parallel to direction of stress, while end distance is measured perpendicular to direction of stress
- b) Edge distance is measured parallel to direction of stress, while end distance is measured parallel to direction of stress
- c) Edge distance is measured perpendicular to direction of stress, while end distance is measured perpendicular to direction of stress
- d) Edge distance is measured perpendicular to direction of stress, while end distance is measured parallel to direction of stress**

Ans d) Edge distance is measured perpendicular to direction of stress, while end distance is measured parallel to direction of stress

9. Minimum edge distance and end distance for rolled, machine flame cut is

- a) 1.7 x hole diameter
- b) 1.2 x hole diameter
- c) 1.5 x hole diameter**
- d) 2.0 x hole diameter

Ans c) 1.5 x hole diameter

10. Maximum edge distance should not exceed _____

- a) $10t\epsilon$, where $\epsilon = \sqrt{(250/f_y)}$, t = thickness of thinner outer plate
- b) $20t\epsilon$, where $\epsilon = \sqrt{(250/f_y)}$, t = thickness of thinner outer plate
- c) $16t\epsilon$, where $\epsilon = \sqrt{(250/f_y)}$, t = thickness of thinner outer plate
- d) $12t\epsilon$, where $\epsilon = \sqrt{(250/f_y)}$, t = thickness of thinner outer plate**

Ans d) $12t\epsilon$, where $\epsilon = \sqrt{(250/f_y)}$, t = thickness of thinner outer plate

11. Spacing of tacking fasteners when exposed to weather should not exceed _____

- a) $32t$, where t = thickness of outside plate
- b) $25t$, where t = thickness of outside plate
- c) $20t$, where t = thickness of outside plate
- d) $16t$, where t = thickness of outside plate**

Ans d) $16t$, where t = thickness of outside plate

12. Shear Capacity of HSFG bolts is

- a) $\mu_f n_e k_h F_o$
- b) $\mu_f n_e k_h F_o \gamma_{mf}$
- c) $\mu_f n_e k_{ho} \gamma_{mf}$
- d) $\mu_f n_e k_h F_o / \gamma_{mf}$**

Ans d) $\mu_f n_e k_h F_o / \gamma_{mf}$

13. Calculate strength in shear of 16mm diameter of bolt of grade 4.6 for lap joint

- a) 50 kN
- b) 40 kN
- c) 29 kN**
- d) 59 Kn

Ans c) 29 kN

14. What is the value of k_b in nominal bearing strength for a bolt of 20mm diameter of grade 4.6?

- a) 0.5**
- b) 1
- c) 0.97
- d) 2

Ans a) 0.5

15. Find the number of HSFG bolts of diameter 20mm, grade 88 for connection of member carrying factored tensile load of 200kN when no slip is permitted.

- a) 5
- b) 4**

- c) 3
- d) 2

Ans b) 4

16. Which of the following type of weld is most suitable for lap and T-joints?

- a) **Fillet weld**
- b) Groove weld
- c) Slot weld
- d) Plug weld

Ans a) Fillet weld

17. Which of the following is true about back-up strip provided at bottom of single-V grooves?

- a) Back-up strips are commonly used when welding is done from both the sides
- b) Back-up strips are commonly used when root opening is sufficient
- c) It creates a problem of burn-through
- d) **It introduces a crevice into the weld geometry**

Ans d) It introduces a crevice into the weld geometry

18. The size of root gap and root face for groove weld does not depend on :

- a) type of welding process
- b) welding position
- c) **type of metal plate**
- d) volume of deposited material

Ans c) type of metal plate

19. Which of the following groove weld is used for plates of thickness more than 40mm?

- a) Double-bevel
- b) Single-J
- c) Single-U
- d) **Double-U**

Ans d) Double-U

20. The production of sound welds is not governed by _____

- a) type of joint
- b) choice of electrode
- c) **type of metal plate**
- d) arc length

Ans c) type of metal plate

21. Which of the following is not a reason for incomplete fusion?

- a) surfaces to be jointed are coated with oxides
- b) insufficient current supplied by welding equipment
- c) high rate of welding
- d) use of large electrode**

Ans d) use of large electrode

22. Which of the following is not true?

- a) Porosity is caused due to insufficient current**
- b) It is caused due to longer arc length
- c) It may be due to poor welding procedure
- d) It results in stress concentration

Ans a) Porosity is caused due to insufficient current

23. Hot cracks can be prevented by _____

- a) faster cooling
- b) non uniform heating
- c) pre-heating
- d) slower cooling**

Ans d) slower cooling

24. Cold cracks can be prevented by _____

- a) uniform heating
- b) by use of low hydrogen electrode**
- c) faster cooling
- d) slower cooling

Ans b) by use of low hydrogen electrode

25. What is face reinforcement used in butt joint?

- a) It is extra weld metal that makes throat dimensions greater than the thickness of the welded material**
- b) It is extra weld metal that makes the throat dimensions smaller than the thickness of the welded material
- c) It is extra weld metal that makes the throat dimensions equal to the thickness of the welded material
- d) It is parent metal makes that the throat dimensions smaller than the thickness of the welded material

Ans a) It is extra weld metal that makes throat dimensions greater than the thickness of the welded material

ChettinadTech