

1. The heaviest I-section for same depth is

- ISMB
- ISLB
- ISHB
- ISWB

2. In case of single angles in tension connected by one leg only, the net effective area as per IS : 800 is

- Gross area-area of holes
- $a + \frac{b}{1+0.33(b/a)}$
- $a + \frac{b}{1+0.2(b/a)}$
- $a + \frac{b}{1+0.33(a/b)}$

3. As per IS : 800, the maximum deflection in a beam should not exceed

- $\frac{L}{180}$
- $\frac{L}{250}$
- $\frac{L}{325}$
- $\frac{L}{360}$

Where L is of beam

4. Bending compressive and tensile stresses respectively are calculated based on

- Net area and gross area
- Gross area and net area
- Net area in both cases
- Gross area on both cases

5. If the thickness of thinnest outside plate is 10 mm, then the maximum pitch of rivets in tension will be taken as

- 120 mm
- 160 mm
- 200 mm
- 300 mm

6. As per IS : 800, the thickness of slab base is given by

- $\frac{3W}{F_b} \left(A^2 - \frac{B^2}{4} \right)$
- $\sqrt{\frac{3W}{F_b} \left(A^2 - \frac{B^2}{4} \right)}$
- $\sqrt{\frac{3W}{F_b} \left(A^2 - \frac{B^2}{2} \right)}$
- $\sqrt{\frac{W}{3F_b} \left(A^2 - \frac{B^2}{4} \right)}$

Where A and B are larger and smaller projections respectively of plate beyond column, W is the pressure on the under-side of base and F_b is permissible bending stress in slab bases.

7. In a gusseted base, when the end of the column is machined bearing on the base plate, then the axial load is assumed to be transferred to base plate

- Fully by direct bearing
- Fully through fastenings
- 50% by direct bearing and 50% through fastenings
- 75% by direct bearing and 25% through fastenings

8. When the axis of load lies in the plane of rivet group, then the rivets are subjected to

- Only shear stresses
- Only tensile stresses
- Both (a) and (b)
- None of the above

9. When the axis of load lies in the plane of rivet group, then the most heavily loaded rivet will be the one which

- Is at the maximum distance from CG of the rivet group
- Is at the minimum distance from CG of the rivet group
- Gives the maximum angle between the two forces F_a is and F_m
- Gives the minimum angle between the two forces F_a F_m

Where, F_a is the shared by each rivet due to axial load and F_m is the sharing load due to moment in any rivet

10. Which of the following types of riveted joint is free from bending stresses ?

- Lap joint
- Butt joint with single cover plate
- Butt joint with double cover plates
- None of the above

11. The difference between gross diameter and nominal diameter for the rivets up to 25 mm diameter is

- 1.0 mm
- 1.5 mm
- 2.0 mm
- 2.5 mm

12. As compared to field rivets, the shop rivets are

- Stronger
- Weaker
- Equally strong
- Any of the above

13. If the thickness of plate to be connected by a rivet is 16 mm, then suitable size of rivet as per Unwin's formula will be

- 16 mm
- 20 mm
- 24 mm
- 27 mm

14. By providing sufficient edge distance, which of the following failures of riveted joint can be avoided

- Tension failures of the plate
- Shear failure of the rivet
- Shear failure of the plate
- Crushing failure of the rivet

15. Minimum pitch of the rivets shall not be less than

- 1.5 d
- 2.0 d
- 2.5 d
- 3.0 d

16. Efficiency of a riveted joint, having the minimum pitch as per IS : 800, is

- 40%
- 50%
- 60%
- 70%

17. Select the correct statement

- Material cost of a rivet is higher than that of a bolt.
- Tensile strength of a bolt is lesser than that of a rivet.
- Bolts are used as a temporary fastenings whereas rivets are used as permanent fastenings.
- Riveting is less noisy than bolting.

18. Bolts are most suitable to carry

- Shear
- Bending
- Axial tension
- Shear and bending

19. Diameter of a bolt hole is usually taken as

- Gross diameter of bolt
- Nominal diameter + 1.5 mm
- Nominal diameter + 2.0 mm
- Nominal diameter of bolt

20. When the bolts are subjected to reversal of stresses, the most suitable type of bolt is

- Black bolt
- Ordinary unfinished bolt
- Turned and fitted bolt
- High strength

21. In the cross-section of a weld, throat is the

- Minimum dimension
- Average dimension
- Maximum dimension
- None of the above

22. The effective length of a fillet weld should not be less than

- Two times the weld size
- Four times the weld size
- Six times the weld size
- Weld size

23. For a standard 45° fillet, the ratio of size of fillet to throat thickness is

- 1 : 1
- 1 : $\sqrt{2}$
- $\sqrt{2}$: 1
- 2 : 1

24. A butt weld is specified by

- Effective throat thickness
- Plate thickness
- Size of weld
- Penetration thickness

25. The actual thickness of butt weld as compared to the thickness of plate is usually

- a. More
- b. Less
- c. Equal
- d. None of the above

26. As per IS : 800, the rivets subjected to combined tensile and shear stresses are proportioned such that

- a. $\left(\frac{f_s}{p_s}\right)^2 + \left(\frac{f_t}{p_t}\right)^2 \leq 1.4$
- b. $\left(\frac{f_s}{p_s}\right) + \left(\frac{f_t}{p_t}\right) \leq 1.4$
- c. $\left(\frac{f_s}{p_s}\right)^2 + \left(\frac{f_t}{p_t}\right)^2 \leq 1.4$
- d. $\left(\frac{f_s}{p_s}\right)^2 + \left(\frac{f_t}{p_t}\right)^2 \geq 1.4$

Where f_s and f_t are respectively actual shear and tensile stresses in a rivet and p_s and p_t are respectively permissible shear and tensile stresses in the rivet

27. According to IS specifications, the maximum pitch of rivets in compression is

- a. Lesser of 200 mm and 12 t
- b. Lesser of 200 mm and 16 t
- c. Lesser of 300 mm and 32 t
- d. Lesser of 300 mm and 24 t

Where t is thickness of thinnest outside plate or angle

28. A circular column section is generally not used in actual practice because

- a. It is uneconomical
- b. It cannot carry the load safely
- c. It is difficult to connect beams to the round sections
- d. All of the above

29. The slenderness ratio of a column supported throughout its length by a masonry wall is

- a. Zero
- b. 10
- c. 100
- d. infinity

30. According to IS specifications, the effective length of a column effectively held in position at both ends and restrained in direction at one end is taken as

- a. 0.67 L
- b. 0.8 L
- c. L
- d. 1.5 L

