

41. The flange splice in plate girders be placed preferably near about
(a) maximum shear location (b) maximum moment location
(c) minimum moment location (d) minimum shear location

42. In plate girders horizontal stiffeners are needed if the thickness of web is
(a) less than 6 mm (b) less than $\frac{L}{200}$
(c) less than $\frac{L}{500}$ (d) nearly equal to flange thickness.

Where d = distance between flanges

L = span of girder

43. The number of plastic hinges which will cause the overall total collapse of a structure is

- (a) one more than the order of statical indeterminacy
- (b) equal to order of statical indeterminacy
- (c) one less than the order of statical indeterminacy
- (d) not determinable

44. The maximum permissible slenderness ratio for steel ties likely to be subjected to compression is

- (a) 400 (b) 350
- (c) 250 (d) 180

45. Which of the following loads are to be considered in designing a gantry girder ?

- (i) Gantry load (ii) Lateral loads
- (iii) Longitudinal loads (iv) Wind loads

Select the correct answer using the codes given below:

- (a) (i) and (ii) (b) (i), (ii) and (iii)
- (c) (i) and (iii) (d) (ii), (iii) and (iv)

46. Where should splices in column be provided ?

- (a) At the floor level (b) At the mid height of column
- (c) At the beam column joint (d) At one-fourth height of column

47. Which one of the following is a compression member ?

- (a) Purlin (b) Boom
(c) Cleat (d) Tie

48. The permissible tensile stress in bolts used for column base is

- (a) 120 N/mm^2 (b) 150 N/mm^2
(c) $0.6 f_y$ (d) $0.4 f_y$

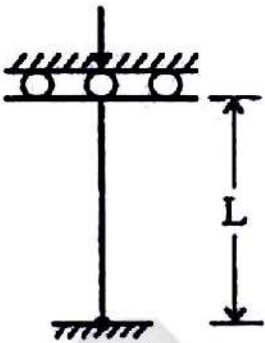
Where f_y is the yield stress

49. The correct maximum shear capacity of a prismatic beam under plastic design of steel structures is

- (a) $A_w f_y$ (b) $0.75 A_w f_y$
(c) $0.55 A_w f_y$ (d) $0.50 A_w f_y$

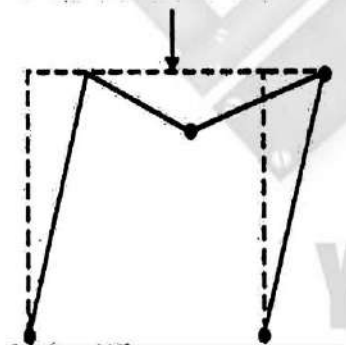
Where symbols have their usual meaning.

50. The effective length of the compression member shown in the figure is equal to :



- (a) $1.2 L$ (c) $2.0 L$
(b) $0.5 L$ (d) $1.5 L$

51. A portal frame has a collapse mechanism as shown in the figure, is a



- (a) pure portal mechanism (b) panel mechanism
(c) combined mechanism (d) beam mechanism

52. In the roof truss for principal rafter most frequently used section is

- (a) two channels placed back to back

- (b) one angle and one channel placed back to back
(c) two angles placed back to back
(d) none of the above

53. Effective length of a column is the length between the points of

- (a) maximum moments (b) zero shear
(c) zero moment (d) none of the above

54. In general, the ratio of the depth of plate girder to its span is taken as

- (a) $\frac{1}{5}$ to $\frac{1}{8}$ (b) $\frac{1}{8}$ to $\frac{1}{10}$
(c) $\frac{1}{10}$ to $\frac{1}{12}$ (d) $\frac{1}{12}$ to $\frac{1}{16}$

55. According to IS : 226 — 1975 axial direct stress in tension member should be by the formula

- (a) $\sigma_{at} = 0.6 f_y$ (c) $\sigma_{at} = 0.2 f_y$
(b) $\sigma_{at} = 0.8 f_y$ (d) none of the above

56. In compression member pitch of tacking rivets at a line should not be more than

- (a) 1000 mm (b) 600 mm
(c) 650 mm (d) 700 mm

57. In beams according to IS : 800 — 1984 permissible average shear stress is calculated by the formula

- (a) $\tau_{va} = 0.40 f_y$ (b) $\tau_{va} = 0.45 f_y$
(c) $\tau_{va} = 0.35 f_y$ (d) $\tau_{va} = 0.3 f_y$

58. Bearing strength of single rivetted lap joint is equal to

- (a) $d \times t \times f_b$ (b) $2d \times t \times f_b$
(c) $2 \times d^2 \times t \times f_b$ (d) none of the above

59. Shear strength in double shear in rivetted joints is given by

- (a) $\frac{\pi d^2}{4} f_s$ (b) $\frac{2\pi d^2}{4} f_s$
(c) $\frac{\pi}{4} d f_s$ (d) none of the above

60. The minimum pitch of rivet hole of diameter d should not be less than

- (a) $1.5 d$ (b) $2.0 d$
(c) $2.5 d$ (d) $1.0 d$

61. A rivetted joint may fail

- (a) in shear (c) in crushing of rivets
(b) in bearing (d) all of the above

62. According Unwin's formula, if t is thickness of plate in mm the nominal diameter of rivet is

- (a) $1.91 t$ (b) $1.91 t^2$
(c) $1.91 \sqrt{t}$ (d) $1.91 \sqrt[3]{t}$

63. Rivet value is equal to

- (a) strength of rivet in shearing (c) strength of rivet in tension
(b) strength of rivet in bearing (d) minimum of (a) and (b)

64. The Euler's formula for column is valid for

- (a) zero slenderness ratio (b) small slenderness ratio
(c) large slenderness ratio (d) all of the above

65. The section modulus and the plastic modulus of a section are Z and S respectively. Then its shape factor is

- (a) $\frac{S-Z}{Z}$ (b) $\frac{S-Z}{S}$
(c) $\frac{Z}{S}$ (d) $\frac{S}{Z}$

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