9

CHAPTER

Gantry Girder

Q.1 Apart from gravity loads which of the following loads are also considered in the design of gantry girder located within an industrial building
(a) Longitudinal load   (b) Lateral load
(c) Both (a) and (b)   (d) None of these

Q.2 What is the additional load to be considered, for vertical forces transferred to the rails for hand operated cranes, when gantry girder is subjected to impact loads?
(a) 25% of maximum static wheel load
(b) 10% of maximum static wheel load
(c) 5% of static wheel load
(d) none of these

Q.3 What is the design shear fatigue stress for a life cycle of N_{sc}?

(a) $\tau_f = \tau_{fn}\sqrt[5]{\dfrac{5\times10^6}{N_{Sc}}}$ (b) $\tau_f = \tau_{fn}\sqrt[3]{\dfrac{5\times10^6}{N_{Sc}}}$

(c) $\tau_f = \tau_{fn}\sqrt[5]{\dfrac{3\times10^5}{N_{Sc}}}$ (d) $\tau_f = \tau_{fn}\sqrt[3]{\dfrac{3\times10^6}{N_{Sc}}}$

where the symbols have their usual meaning.

Q.4 Computation for fatigue strength should be made at service load with a load factor of
(a) 1.15   (b) 1.5
(c) 2   (d) none of these

Q.5 What is the vertical deflection limit for Gantry girders with electrically operated cranes of capacity exceeding 500 kN?
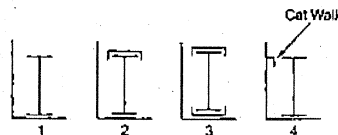
(a) $\dfrac{L}{500}$ (b) $\dfrac{L}{600}$

(c) $\dfrac{L}{750}$ (d) $\dfrac{L}{1000}$

Q.6 Which one of the following is the most efficient section for a simply supported gantry Girder.
(a) Symmetrical *I*-section
(b) Back to Back connected channel section
(c) *I*-section with channel section at the top flange
(d) Box section

Q.7 Which one of the following statement is correct?
In a crane gantry girder, a channel is provided at the top flange of the girder. This accounts for bending in
(a) horizontal plane only
(b) vertical plane only
(c) horizontal and vertical planes
(d) horizontal and vertical planes and twisting

Q.8 A gantry girder has been provided with the following sections as shown in the following figures:

In which case (s), the allowable stresses in bending compression is equal to that in tension? Select the correct answer using the codes given below:
(a) 1 and 2   (b) 2 and 3
(c) 4 only   (d) 3 only

Q.9 The maximum permissible deflection for a gantry girder of span 6 m on which an EOT crane of capacity 200 kN is operating is
(a) 8 mm   (b) 10 mm
(c) 12 mm   (d) 18 mm

■■■■

Answers   Gantry Girder.

1. (b)   2. (b)   3. (a)   4. (d)   5. (d)   6. (c)   7. (a)   8. (c)   9. (a)

Explanations   Gantry Girder.

4. **(d)**
Computation for fatigue strength should be made at service loads with a load factor of 1.0.

8. **(c)**
When the compression flange is laterally supported by either a cat walk or by additional member then the allowable stress in bending compression is equal to that in tension.

9. **(a)**
Maximum permissible deflection for EOT crane operated gantry giver

$= \dfrac{\text{Span}}{750} = \dfrac{6000}{750}\ \text{mm} = 8\ \text{mm}$

■■■■