

JK Lakshmipat University, Jaipur

Institute of Engineering and Technology

End Term Examination

B.Tech. [III Year]/ [5 Semester]/ [2013-2014]



Course Name: Steel Structures -1

Course Code: CE 503

Instructions:

Max Marks: 40

Time: 03.00 Hr

1. Attempt all sections.
2. Neat diagrams must be drawn wherever necessary.
3. Use of electronic non programmable calculator, use of I.S.800-2007+1984 and steel table for Rolled section is allowed.
4. Assume suitable data, if necessary.

Section A

(10 Marks)

Q.1. complete the following statements:

- (a) For simply supported beams, the maximum permitted deflection, is
- (b) The slenderness ratio in column is ratio of
- (c) The radius of gyration is defined
- (d) Efficiency of the riveted joint is ratio of
- (e) A structural member subjected to compressive stress in direction parallel to its longitudinal axis, is generally known as

Q.2. (a) what are the assumption made in riveted connection?

(b) What are the mechanical properties of structural steels?

Section B

(20 Marks)

Attempt any four question.

Q 3. An I.S.A. 100mm × 100mm × 6mm ($f_y = 250 \text{ N/mm}^2$) is used as a strut in a truss. The length of the strut between the intersections at each end is 3.0 m. calculate the strength of the strut if

- (a) It is connected by two rivet at each end.
- (b) It is connected by one rivet at each end.

Q 4. calculate the safe axial load for a stanchion I.S.H.B. 350 @ 710.2N/m, 3.5m high. it is to be used as an uncased column in a single storey building. The column is restrained in direction and position at both the ends $f_y = 250 \text{ N/mm}^2$.

Q 5. Define the following term.

Joist, girder, purlins, lintels, gauge (g) distance, pitch distance, nominal diameter, gross diameter.

Q.6. A 6mm thick angle section is joined to a 10mm thick gusset plate. The angle is supporting a load of 55 kN. Find out the number of 16 mm diameter power driven rivets.

Q.7. determine the strength of a 20mm diameter ordinary turned bolt if it is used to connect:

(a) Two plate each 10 mm thick.

(b) Three plates, the outer two plates 8 mm thick each and the intermediate plate 14 mm thick.

$$\tau_{vf} = 100\text{N/mm}^2, \quad \sigma_{pf} = 300\text{N/mm}^2$$

Section C

(10 Marks)

Q.8. A simply supported steel joist with a 4.0m effective span carries a uniformly distributed load of 40 kN over its span inclusive of self-weight. the beam is supported laterally throughout. Select a suitable section ($f_y = 250\text{N/mm}^2$).