Roll No.

Total No. of Questions : 09

B.Tech. (CE) (2012 to 2017)   (Sem.–7,8)
DESIGN OF STEEL STRUCTURES-II
Subject Code : BTCE-801
M.Code : 71859

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTION TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Answer briefly :

a) List the items that are to be considered while planning and designing an industrial building.

b) What are the components of a crane runway system?

c) What is the function of sway bracing?

d) Write a short note on single track Railway Bridge.

e) What is difference between riveted plate girder and welded plate girder?

f) What is difference between lateral and longitudinal bracing?

g) What is bearing rocker and roller? Describe in brief their utility?

h) Why is curtailment of flanges carried out in the design of a plate girder?

i) Explain Stringer.

j) Explain cross-girder.

SECTION-B

2) Design a suitable bearing for a foot bridge having clear road way of 12m and effective span of 25m.

3) Differentiate between Deck type and through type truss bridges. Show various parts of truss bridge with the help of a diagram.

4) The dead load, live load and impact load reaction at the end of a bridge girder is 1000 kN. The vertical reaction at each end of the girder due to overturning effect of wind is 50 kN. Design the roller bearing. The least allowable perpendicular distance between the faces of adjacent rollers after the revolved position may be taken as 6 mm. The; centres of rollers travel 25 mm.

5) Determine the flexural design strength of plate girder having simply supported connection and continuous lateral support. Flange : 650×50 mm, web : 2000×12 mm, span 16 m and only flanges resist bending moment.

6) Design a suitable bearing for a foot bridge having clear road way of 10m and effective span of 20m.

SECTION-C

7) Design a Gantry girder without lateral restraint along its span, to be used in an industrial building carrying a overhead travelling crane for the following data :

Crane Capacity = 300 kN.

Self-weight of crane girder excluding trolley = 250 kN.

Self- weight of trolley, electric motor, hook etc = 40 kN.

Approximate minimum approach of crane hook to the gantry girder = 1.3 m.

Wheel base = 3.55 m.

CIC distance between gantry rails = 15 m.

Span of gantry girder = 7 m.

Self-weight of rail section = 350 N/m.

Yield stress of steel = 250MPa.

8) Design a railway bridge for following data :

Type of bridge = Deck type plate girder bridge.

Span = 18m between centers of bearings. Gauge - broad, single track, main line.

Distance between centers of plate girders = 1.9 m.

9) Explain the following :

a) Column Bracket

b) Stiffeners

c) Roller rearing