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Total No. of Pages: 04
Total No. of Questions: 09

B. Tech. (CE)(Sem.-7th & 8th)
DESIGN OF STEEL STRUCTURES-II
Subject Code: CE-408
Paper ID: [A0627]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTION TO CANDIDATES:-

- 1) Any missing data can be suitably assumed clearly stating the same.
- 2) Support your answers with labeled sketches wherever possible.
- 3) Use of IS: 800 and I hand book on Structural Steel is allowed.
- 4) Section A is compulsory, attempt any 4 questions from section B and attempt Any 2 questions from section C.
- 5) Marks are shown against each question.

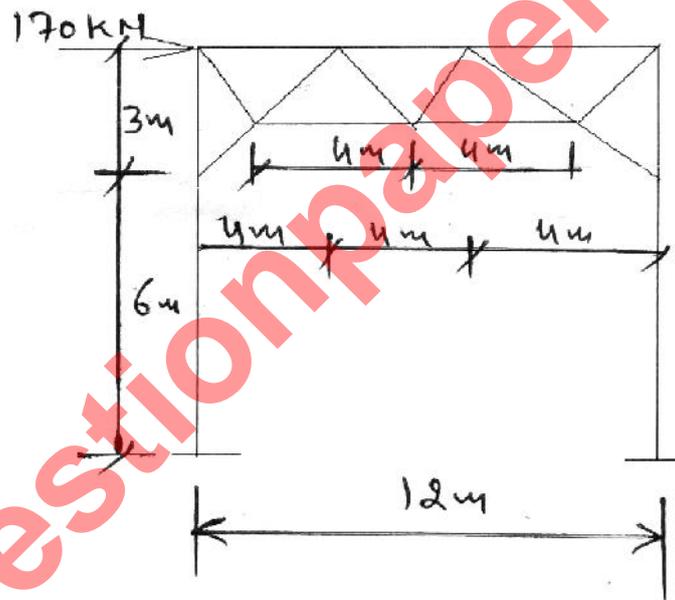
SECTION A

I.

- a) Write a short note on fillet welds in truss members.
- b) Write a short note on angle seat connection.
- c) What are various locations where foot bridges are used?
- d) List the various forces, which are used for design of gantry girder.
- e) What are the different types of bracings used in a braced building?
- f) State the advantages of using a knee brace.
- g) List the various loads to be considered in the design of Railway Bridge
- h) "No allowance for impact is to made for foot bridges". Give your comments
- i) Discuss the role of stringer in Railway Bridge.
- j) What is the function of bracing in steel structures? (2x10)

SECTION B

2. Draw neat sketches and explain the design principle of the following welded connections for the transfer of shear only.
 - a) Unstiffened seat connection.
 - b) Stiffened seat connection. (5)
3. Describe the design procedure for main girders in railway bridge. (5)
4. Describe the design procedure for Foot Bridge (5)
5. Describe the design procedure for Gantry Girder (5)
6. Fig below shows a portal bracing in a through truss girder bridge subjected to a lateral force of 160 kN Determine the forces in various members of the portal bracing. (5)



SECTION C

7. The effective span of a through truss girder railway bridge for a single BG track is 45.0m. The spacing between main truss girders is 6.8 m. The rail level is 800mm above the C.G. of the bottom chord. The chord members and end posts are 560 mm deep and 660 mm wide. The inner web members are 600 mm deep

and 280 mm wide. Design the top lateral bracing and bottom lateral bracing for the through truss girder railway bridge for a single BG track. (10)

8. Design a gantry girder to carry an electric overhead traveling crane to suit following data:

Crane capacity	...200 kN	
Wt. of crab alone	...70 kN	
Wt. of crane	...150 kN	
Minimum approach of crane hook	...1.2 m	
Dist. between centres of crane wheels	...3.5 m	
Dist. between cranes of gantry girders	...18.0 m	
Span of gantry girder	...7 m	
Wt. of rail section	...0.300 Kn/m	
Height of rail section	...80 mm	(10)

9. Design the column section for the industrial building in which the pitch of the roof truss is 1 in 4. The spacing of roof truss is 4 m. The span of roof truss is 16 m. Adopt the following values of various load coming over the column from other component of industrial building.

Reaction from roof truss including weight of purlins, roof covering material etc. = 18.00 KN.

Reactions from side rail and sheeting = 9.5KN.

Reactions from crane gantry girder and rails = 5.61 KN.

And it acts at distance of 250 mm distance from the face of the column.

Reactions due to live load = 19.20 KN.

Basic wind pressure = 1.50 KN/m²

Height of column upto eaves level = 8 m.

The crane is 5 m above the base.

Crane capacity = 300 KN.

Weight of crane excluding trolley = 190 KN.

Weight of trolley = 100 KN

Minimum approach of the crane hook = 1.2 m.

Distance between centre of crane wheels = 3.5 m.

Distance between centre of gantry girder = 17m

(10)

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