PAPER ID-310474

Subject Code: KCE075

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2023-24
DESIGN OF STEEL STRUCTURES

TIME: 3 HRS **M.MARKS: 100**

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.
2. IS800-2007 and steel table allowed

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question
a.	What do you understand by strengthen of existing steel structures?
b.	The yield strength for a mild steel specimen was found to b3e 250 N/mm^2. Taking a factor of safety of 3. Find out the working stress.
c.	Write the disadvantages of bolted connections.
d.	Draw the neat sketch of shear transfer by bearing type bolt.
e.	What do you meant by gross section yielding by steel members?
f.	Write the factor for method of fabrication in tension members.
g.	Define boom.
h.	Write the assumptions take design of axially loaded compression members.
i.	What do you understand by grit?
j.	Where built-up beams are used?

SECTION B

2. Attempt any *three* of the following: **10x3=30**

a.	How you will be classified the structural steel by Bureau of Indian Standards.
b.	Calculate the strength of a 20 mm diameter bolt of grade 4.6 for the following cases . The main plates to joint are 12 mm thick 1. Single cover butt joint : the cover plate being 10 mm tick . (ii) Double cover joint; each of the cover plate being 8 mm thick.
c.	Explain the typical tension members with their uses.
d.	Design a double angle discontinuous strut to carry a factored load of 175 kN. The length of strut is 3 m between intersections. The angles are placed back to back and then bolted. Case angles are placed on opposite sides of gusset plate.
e.	Explain with idealized elasto-plastic stress-strain curve for behavior of beam in flexure.

SECTION C

3. Attempt any *one* part of the following: **10x1=10**

a.	Explain Serviceability design model and recommendations for Ponding.
b.	A multistory building is proposed in Lucknow (Basic wind speed = V_b = 44 m/sec.) Determine the design wind pressure if the return period is 50 years the design wind pressure if the return period is 50 years the size of building is 25 x 50 m and the height is 150 m.

4. Attempt any *one* part of the following: **10x1=10**

a.	What are the various types of groove welds? Explain with neat sketches
b.	A tie members of truss consisting of an angle section ISA 65mm x 65mm x6 mm of Fe410 grade of steel, is welded to a 8 mm thick gusset plate. Design the weld to transmit a load equal to the full strength of the member. Assume shop welding.

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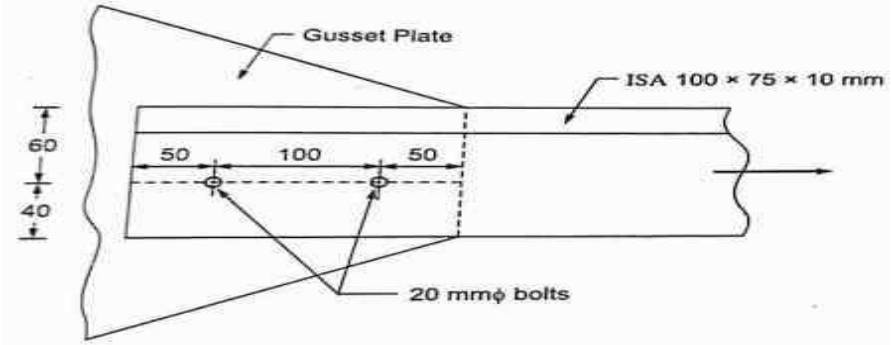
5. Attempt any *one* part of the following: 10x1=10

a.	Determine the block shear strength of the tension member shown in fig .Use the steel of grade Fe410. 
b.	Explain with neat sketch stress –distribution in a plate adjacent to hole due to tensile force.

6. Attempt any *one* part of the following: 10x1=10

a.	Determine the design axial load on the column section ISMB350. Given that the length of column is 3 m, the column is pin ended. Use steel of grade is Fe410. Take E = $2x10^5$ N/mm^2
b.	How you will be composed to compression member of two components Back-to-back? Explain.

7. Attempt any *one* part of the following: 10x1=10

a.	A simply supported beam ISMB 400@603.8 N/m has an effective span of 5m. Find the design bending strength of the beam if the compression flange of beam is laterally unsupported. Use f_y = 250 N/mm^2.
b.	With neat sketch of elevation and cross section, explain the components of bolted plate girder.