GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester Examinations) – October' 2021

MPCSE2010 – ADVANCED REINFORCED CONCRETE DESIGN

(Structural Engineering)

Time: 2 hrs   Maximum: 50 Marks

(The figures in the right hand margin indicate marks)

PART – A

Q.1. Answer *ALL* questions   (2 x 10 = 20)

a. What are the effects of large deflection?

b. Distinguish between limit states of collapse and limit state of serviceability?

c. Explain the use of partial safety factors

d. What is meant by punching shear?

e. Examine the function of horizontal steel in corbel

f. How a deep beam differs from ordinary RC beam? Under what circumstances deep beams are preferred?

g. State the assumptions of equivalent frame method.

h. State the functions of drop panel and column capital in a flat slab.

i. Draw the moment rotation curve for different types of connections

j. What are split beam connections?

PART – B   **(6 x 5 = 30 Marks)**

Answer *ANY FIVE* questions   Marks

2. An interior panel of a flat slab floor is 4.5m x 4.5m along column centre lines. Live load on floor is $4kN/m^2$. Supporting column diameter is 450 mm. Choosing the thickness of the slab (from stiffness criteria) and appropriate dimensions for column head and drops, Examine the design moments and shear forces. Use direct design method.   (6)

3. Explain the Guidelines for design of Square slab &Rectangular slab with different boundary conditions subjected to UDL and concentrated loads   (6)

4. Design a bolted bracket connection to support an end reaction of 400kN because of the factored loads supported by the beam. The eccentricity of the end reaction is shown in the figure. The steel used is of grade Fe410. Use bolts of grade 4.6. The thickness of bracket plate may be taken as 10mm.   (6)

(a) Front view   (b) Plan
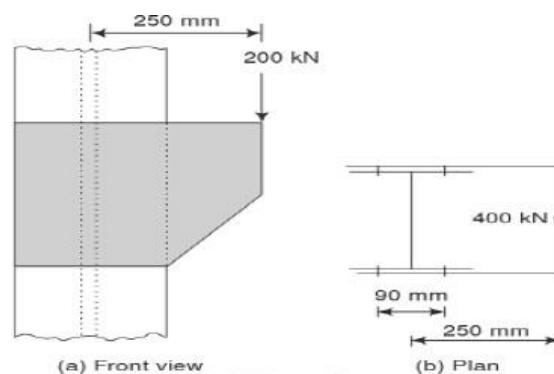
5. Discuss and design a single unequal angle strut to carry a load of 90 kN. The angle is connected by its longer leg to 8 mm thick gusset plate. The effective length of the member is 2.5 m. Also design the plate bolted end connections. (6)

6. Identify and determine the allowable load per metre on the beam as shown below. Also, determine the deflection at the allowable load. The length of the column is 3.1m. the two sections are joined together by spot welding. The steel has a yield point of 235N/mm2. Take $E = 2 \times 105$ N/mm2. (6)
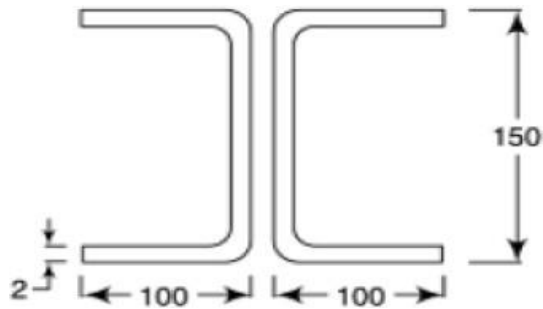
7. Summarize the merits and demerits of cold from light gauge steel section. Also enlist and draw the different sections used in cold from steel. (6)

8. A single –bolted double-cover butt joint is used to connect two plates which are 8mm thick. Assuming 16mm diameter bolts of grade 4.6 and cover plates to be 6mm thick, calculate the strength and efficiency of the joints, if 4 bolts are provided in the bolt line at a pitch of 45mm. Also determine the efficiency of the joint if two lines of bolts with 2 bolts in each line have been arranged to result in a double-bolted double-cover butt joint. (6)

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