

FIFTH SEMESTER DIPLOMA EXAMINATION IN CIVIL ENGINEERING AND QS & CM

STRUCTURAL DESIGN

MODEL QUESTION PAPER

(Maximum marks: 100)

(Time: 3 Hrs)

{ Note :- Use of IS 456-2000,IS 800-2007,SP-16 and steel tables are permitted }

PART - A *Answer all questions in one or two sentences:* (5x2=10Marks)

- Q I**
- 1 Which are the various grades of concrete used for RCC?
 - 2 Distinguish between a beam and a Lintel.
 - 3 Which are the two ways of spanning a stair?
 - 4 What is meant by laterally supported beam?
 - 5 Write the equation and explain the notations for the design strength of a tension member in rupture.

PART - B *Answer any five from the given seven questions* (5x6=30Marks)

- Q II**
- 1 Derive the equation for the Neutral axis depth of a singly reinforced section.
 - 2 Distinguish between singly and doubly reinforced beam and state the circumstances in providing a doubly reinforced beam.
 - 3 How the slabs are classified? How are they distinguished?
 - 4 When and where a combined footing is provided? What are the precautions to be taken in providing them?
 - 5 Determine the net area A_n for the tension member shown in figure when:
 - (a) holes are drilled
 - (b) holes are punched.



- 6 Which are the different failure modes of an axially loaded column?
- 7 Explain the functions with sketches of any four of the following parts of a truss:
 - (a) top chord
 - (b) bottom chord
 - (c) sling
 - (d) strut
 - (e) sag tie.

- (b) Design a longitudinal fillet weld to connect a plate of 100x12mm to a gusset plate of 160x12mm (Fe 250) to transmit a pull equal to the strength of the plate. The grade of weld is $f_u=410$ and welding is done in the workshop. 10

Module – IV

- QIX** (a) Differentiate a plated beam from a plate girder. 6
- (b) I beams provided in a hall has an effective span of 8.3m and spacing of 3m. The beam has an RCC slab of 100mm thickness, finishing load of 1.5 kN/m^2 , live load of 2 kN/m^2 and self weight of beam as 0.8 kN/m . Design a suitable section and check for shear. 9

OR

- QX** (a) What are the different types of sections used as purlins? What governs the spacing of purlins over a truss? 6
- (b) Design a single angle strut connected to the gusset plate to carry 180kN factored load. The length of the strut between centre to centre of intersection is 3m. 9

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