6. (a) State the r for determining the effective span ngitudinally supported stairs as per]. (10)

(b) Describe any transversely supported stairs with sk s. (10)

7. Design a shor ctangular column in moderate enviror subjected to an axial load of 1500 kN ending moment of 250 kNm. Adopt M3C crete and Fe500 grade steel. (20)

8. Design the footin the column subjected to an axial force)0 kN and moment of 60 kNm. Assume of soil as 200 kN/m² at 1.5m depth; U)0 concrete and Fe415 steel for the foo Note that moment is reversible. (20)

Roll No. .....

23393

M. Tech. 1st Sem. Civil Engg. (Specialisation in Structural Design) Examination– December, 2016

DESIGN OF STRUCTURES-I

Paper : MTSD-104

Time : 3 hours ***Max. Marks : 100***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note: Attempt any **five** questions. All questions carry equal marks. Use of IS : 456 is allowed. Use of Steel Table is allowed. Use of IS 800-1984 or 2007, IS 875-1987 and IS 801-1975 is allowed. Assume suitable date whenever necessary.

1. (a) Using a lug angle, design a suitable riveted end connection for an angle

ISA 110×110×1 ı thick, using 20 mm diameter shop . (10)

(b) Design comple a built up column composed of nel sections placed back to back a arrying an axial load of 1500 kN. It gth is 6m and it is effectively held osition at both ends and restrained inst rotation at one end. Take fy= 2 /mm² (10)

2. Design an I- sectio lin for the following data:

Spacing of roof trus ı

Spacing of purlins : n

Pitch of roof: 1/ 6

Weight of G.I sheeti 37 N/m²

Wind load intensi rmal to roof: 1750 N/m² (20)

3. (a) An equal angle ım × 75mm @11.0 kg/m is subjec ı a load of 180 kN, whose line of a passes through the centroid of th ction, which is at 22.2mm from th l. The angle is to be welded to a gus ate. If the size of the

weld is to be 8mm, find the length of the side fillet weld. (10)

(b) What are the different types of weld? Explain with neat sketch. (10)

4. (a) Design a pin to connect two pairs of parallel eye bars of size 200×50mm. The space between the inner pairs is 75mm apart. Take fy= 250 N/mm². (10)

(b) Design a double bolted lap joint for a plate of 20mm thickness to carry its full load. (10)

5. The slab of a residential building of size 5m x 8m is simply supported on all the four sides on 210mm walls. Assuming an imposed load of 2 kN/m² and load due to finishes of 1.0 kN/m², design the floor slab. Use M25 concrete and Fe415 steel. Assume mild exposure. (20)