

PURBANCHAL UNIVERSITY

2024

B.E. (Civil)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG361CI: Design of Steel & Timber Structures (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Is 800-1984, IS 883-1970 and structural steel sections table are allowed for use. Assume any missing data but use 250MPa Steel unless otherwise specified.

Answer FIVE questions.

5×16=80

1(a) Define codes and specifications for design of steel structures? 6

(b) A lower chord of truss has a vertical member BE and diagonal member BF meeting at point B in it, as shown in figure 1.b along with the axial forces. Design the riveted connection using hand driven field rivets. 10

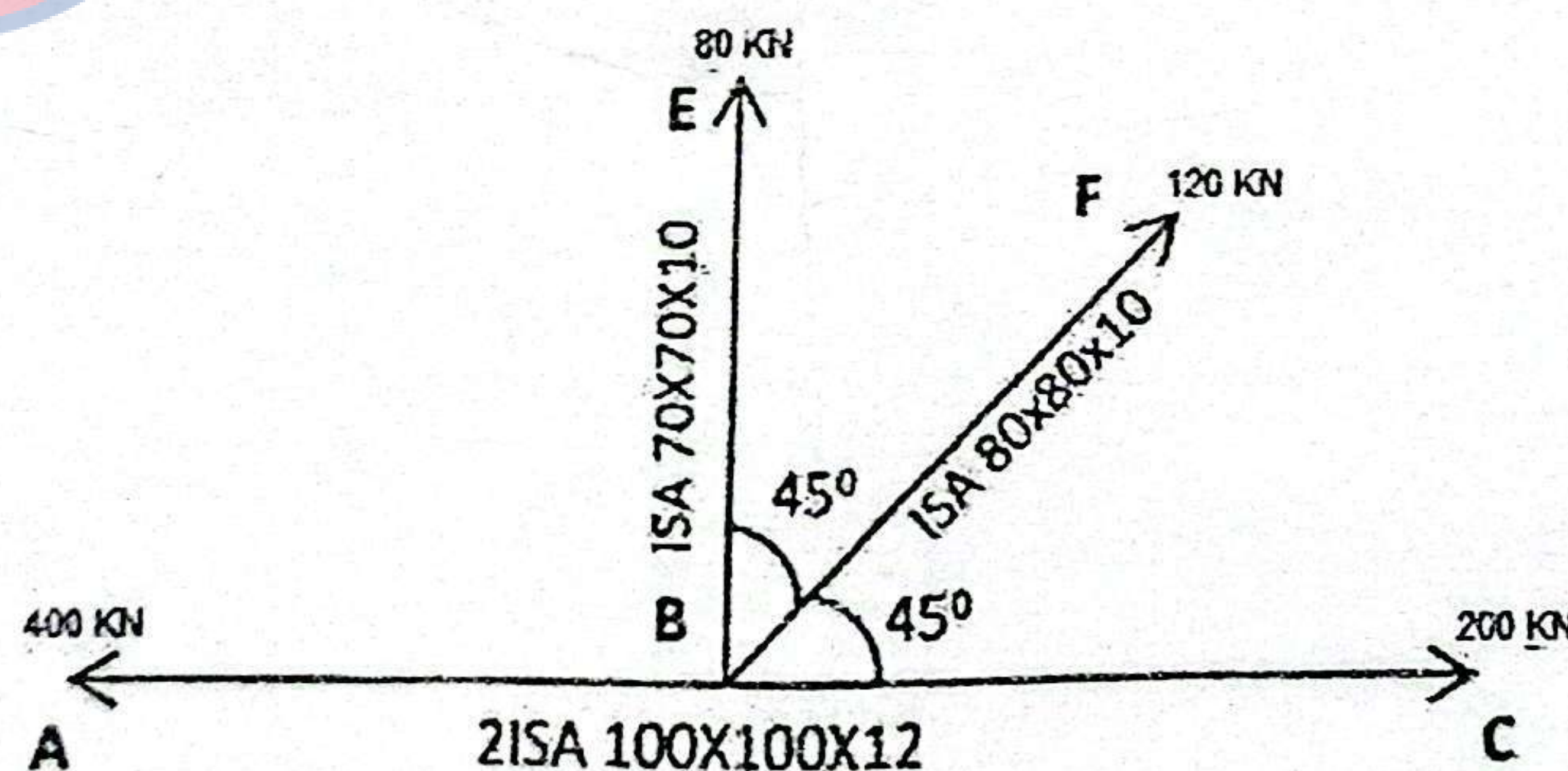


Fig: 1.b

2(a) A load 200 kN is applied to bracket plate an eccentricity of 300mm. 16nos power driven field rivet of 16mm dia. are arranged in two rows with 8 rivets per row as shown in figure (2.a) the rows are 250mm. The pitch of rivets in each vertical row is 80mm. Investigate the design the safety design. The thickness of bracket plate is 12.00mm. 8

Contd. ...

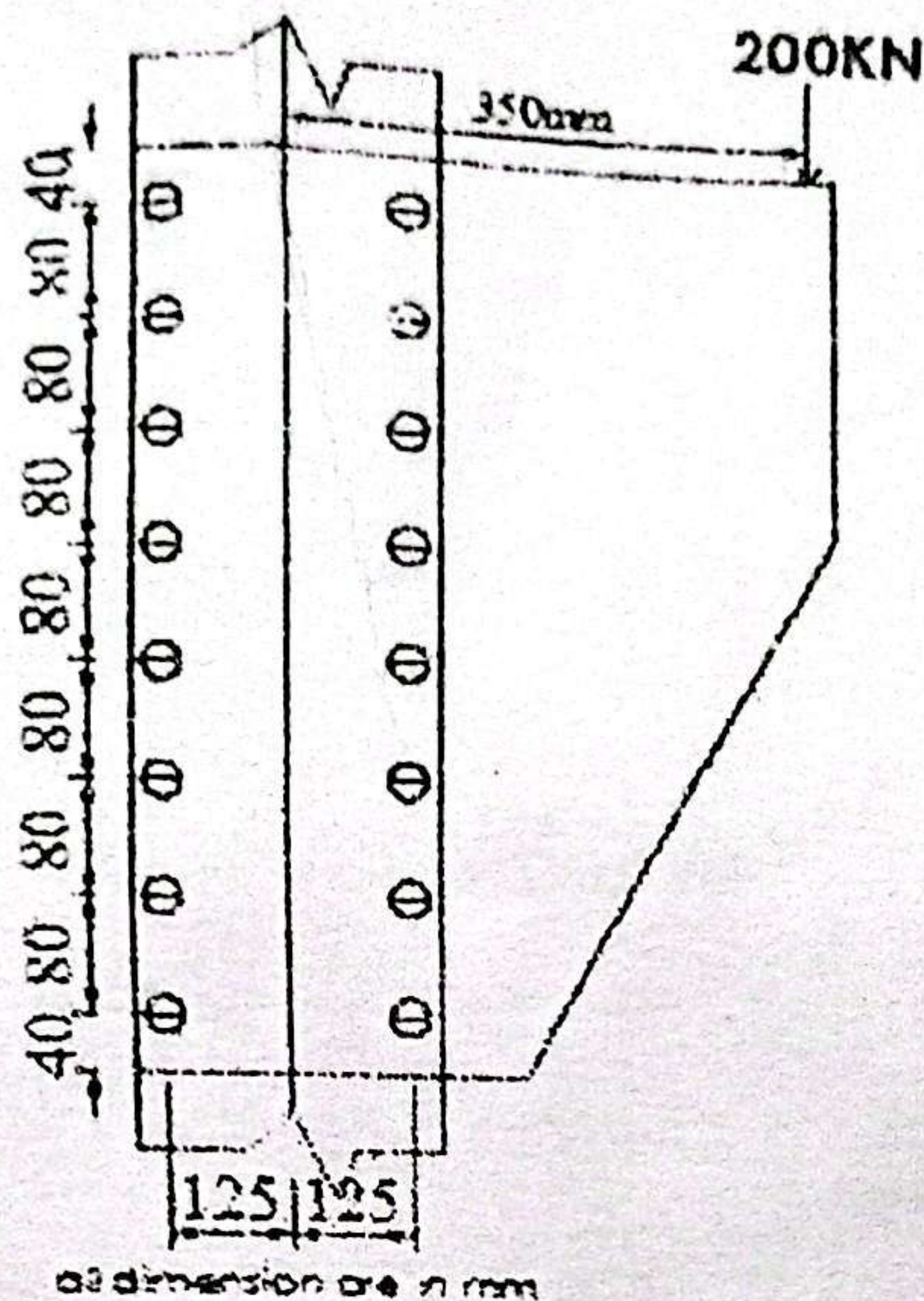


Fig. 2.a

- (b) Design end connection for an angle ISA 125 X 75 X 10 mm thick using lug angle with 25mm dia. Power driven field rivets. 8
3. A column of 5.0m long is effectively held in position at both ends but restrained against rotation at other end and carries an axial load 2300 KN. Design the batten of built-up column which shall consist of two I-sections at suitable spacing. 16
4. A beam of span 7m carries uniformly distributed load of 30KN/m over the whole length. Design the suitable beam assuming that the compression flange is laterally restrained throughout the length. 16
- 5(a) Determine the wind pressure to be considered on a sloping roof from the following data: basic wind speed=46 m/s, span of building 12m, pitch of roof = 1/3, height of eaves above ground = 5m, Risk $C_{pi} \pm 0.2$ for C_{pe} see in table attached. 8
- (b) Define plate girders. Various forms of plate girders and components of plate girders? 8
- 6(a) A column carries an axial load of 1800KN inclusive of self-weight. The length of column is 3.8m. Design a built-up column? 8
- (b) Calculate the form factor and load carrying capacity for the Timber built-up beam of Group A and located for outside location. Size of I beam web = 8cm×60cm and flange = 8cm×50cm 8