1. Design the principal tie member to carry a tensile force of 40 kN. The panel length is 3 m. Design the connection. Apply the slenderness check?

2. Design a tension member to carry a load of 280 kN. The two angles placed back to back with long legs out standing are desirable. The length of the member is 2.9m?

3. Explain Euler's formula for buckling of column. Define ideal column. Differentiate columns based on their buckling load for different end conditions?

4. Determine the tensile strength of roof truss diagonal of 150×75×10mm connected by its long lag to a gusset plate 8mm thick by 6mm welds. Adopt $f_y = 250$ MPa?

5. Design a compression member of a single storey building which has to support a service load of 700 kN. The member has an effective length of 7.0 m with respect to z-axis and 5.0 m with respect to y-axis. Use steel of grade Fe410?

6. Determine the load carrying capacity of a compression memberISHB350@67.4kg/m, 3.5 m long and bounded by cover plate of size 300mmx20mm on each flange in a steel building which is restrained against direction and position on both the ends. Use steel of grade Fe410?

7. Design a tubular compression member 2.5 m long in a truss girder bridge to carry a load of 100 kN at service state. The member is subjected to reversal of stresses?

8.Determine the design loads on the purlins of an industrial building near visakhapatnam,given :Class of building: General with life of 50 years, Terrain category2.Maximum dimension=40m, width of building=15m, Height at eve's level=10m,Topography=☐less than30,permeability= medium, span of truss = 16 m,pitch=1in5,sheeting=A.C.sheets,s pacing of purlins = 1.35m, spacing of truss=4m.

9.Determine the design forces in the members of a Fink type roof truss for an industrial building for the following data. Also find the reaction.

overall length of the building =48m

overall width of the building =16.5m

width (c/c of roof columns)=16m

rise of truss= 1/4 of span

self weight of purlins= 318N/m

height of columns=11m

roofing and side coverings = asbestos cement sheets (dead weight =171N/m2)

the building is located in industrial area Naini, Allahabad. both the ends of the truss are hinged. use steel of grade Fe 410.