

T.E Civil VI CBGS

QP Code : 4975

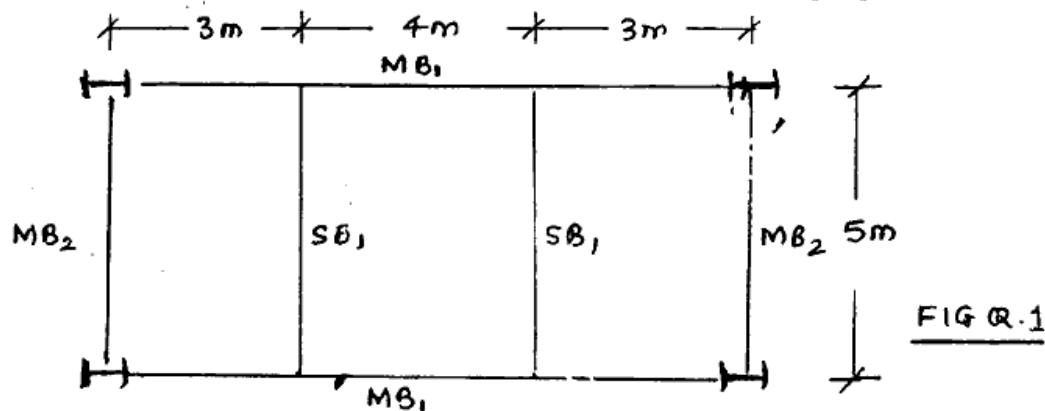
Design & drawing of  
steel structure  
(4 hrs)

Maximum Marks-80

N.B.-

1. Question no, 1 is **compulsory**, Attempt **any three** out of remaining **four** questions.
2. Draw neat & proportionate sketches wherever necessary.
3. Use of IS-800 and steel table is **permitted**.
4. Assume suitable data if necessary but justify the same.

Q.1 The flooring system for an industrial shed is as shown. Design the beams  $SB_1$ ,  $MB_1$  and the connections between them. Use I- sections for beams & provide cover plates if necessary. Top flanges of beams are at same level and embedded in concrete of 200 mm thick RCC slab. The parapet wall of 230 mm thickness and 1.2 m in height is provided on all peripheral beams. (32)



OR

Q.1 Figure shows the configuration of a Compound Fink roof truss having span as 12 m, rise 3 m with spacing of trusses 4 m c/c. Take a section 1—1 and calculate forces in members BC, FC and FG due to dead load, live load and wind load. Also design the members. Assume suction pressure on both slopes as  $5 \text{ kN/m}^2$ . (32)

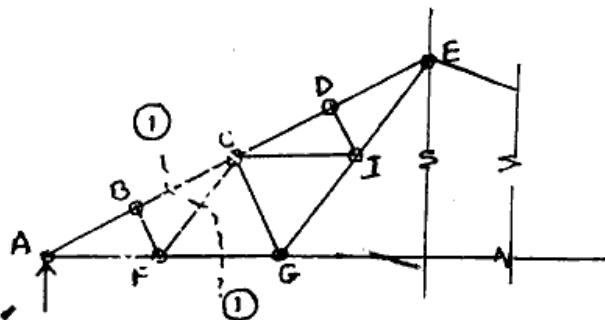


FIG Q.1

Turn Over

(76)

T.E. Civil VI CBGS

2

QP Code : 4975

18.5.15

Design & drawing of  
Steel structure

Q.2 (a) Two channels ISMC 300@ 71.6 Kg/m are placed back to back to form a laced column. The height of column is 9 m having both ends effectively held in position & also restrained against rotation. Determine load carrying capacity of column if

- (i) the spacing between their webs is 160 mm
- (ii) the spacing between their webs is 180 mm
- (iii) the spacing between their webs is 200 mm

Which of the above arrangement is advisable? Give reason. (12)

(b) Develop the equation for bending moment acting on a batten. (4)

Q.3 An ISHB 300 with one cover plate 400 mm x 16 mm on each flange is used as a column for effective height of 4.8 m. Find the load carrying capacity of column. Design the suitable welded connection between cover plate and I-section. Also design the suitable slab base. Assume safe bearing pressure on concrete and soil as 6000 KN/m<sup>2</sup> & 160 KN/m<sup>2</sup> respectively. (16)

Q.4 Design the central section of 25 m long plate girder subjected to a factored load of 60 KN/m inclusive of self weight. Provide suitable curtailment of flange plates. Also design suitable welded connection between web and flange plates. (16)

Q.5 (a) Explain web buckling & web crippling in beam. (4)

(b) Determine the load 'P' that can be safely applied on the bracket connection as shown. All the connection bolts are of 20 mm diameter and dimensions shown are in mm. (12)

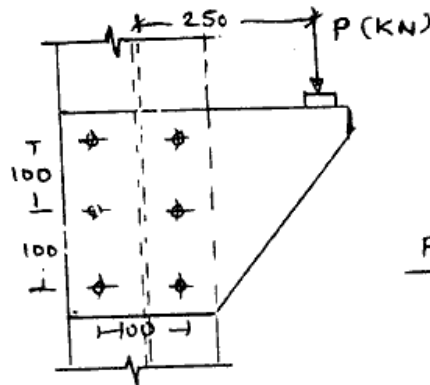


FIG Q.5(b)