1273262

No. of Printed Pages : 3

ET-508(B)

B. TECH. CIVIL (CONSTRUCTION MANAGEMENT)/B. TECH. CIVIL (WATER RESOURCE ENGINEERING) (BTCM/BTWRE)

Term-End Examination

June, 2019

ET-508(B) : STRUCTURAL DESIGN-II

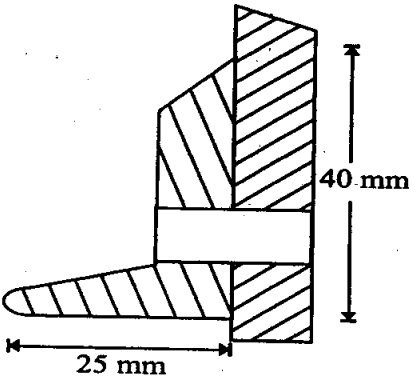
Time : 3 Hours *Maximum Marks : 70*

Note : *Attempt any **four** questions. All questions carry equal marks. Use of calculator is permitted.*

1. A 16 mm thick plate is joined by double cover butt joint using a 10 mm thick cover plate. The steel of main and cover plate conforms to IS : 226 having permissible tensile strength of 150 MPa. Determine the strength and efficiency of the joint per pitch of 9 cm if 20 mm diameter power driven shop rivets are required. Allowable stresses in shear and bearing are 100 MPa and 300 MPa respectively. $17\frac{1}{2}$

2. Calculate the strength of ISA 40 × 25, 6 mm thick when used as a tension number with its

longer leg connected by 14 mm diameter rivets as shown in figure. $17\frac{1}{2}$



3. A simply supported beam of span 10 m is carrying a uniformly distributed load of 30/kN-m. Design a beam using standard I-sections, if the compression flange of the beam is laterally supported throughout its length. $17\frac{1}{2}$

4. A column of ISMB 400 is subjected to an axial force of 750 kN. Design the base plate. Assume M-15 pedestal concrete mix and the permissible stress in slab base as 85 MPa. $17\frac{1}{2}$

5. Design an angle purlin for a trussed roof from the following data : $17\frac{1}{2}$

   Span of roof truss = 12 m

   Spacing of roof trusses = 5 m

Spacing of purlins along the slope of roof = 1.2 m

Slope of roof truss = 1 vertical to 2 horizontal

Wind load on roof surface normal to roof

$= 1.04\ kN/m^2$

Vertical load from roof sheeting = $0.200\ kN/m^2$

6. (a) What is a bunker ? Explain the places where steel bunkers are used. $7\frac{1}{2}$

(b) Using "Airy's Theory", show that maximum depth of bunker can be expressed as : 10

$$h_{max} = b\left[\mu + \frac{\sqrt{\mu + (1+\mu^2)}}{\mu + \mu'}\right],$$

where b = breadth of bunker.

800