No. of Printed Pages : 3

BICEE-009

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00655 **June, 2019**

BICEE-009 : ADVANCED STEEL DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***four*** *questions. Use of scientific calculator is permitted. Use of IS 800 code and SP 6 is permitted. Assume any missing data suitably.*

1. (a) Discuss various steps involved in the design of a gantry girder. 8

(b) What are the requirements to be considered by the designer while selecting a crane and designing a crane supporting structure ? 5

(c) How can the effect of rail eccentricity be counteracted ? $4\frac{1}{2}$

2. Design a welded cylindrical tank with hemispherical bottom for a capacity of 125 KL. The height upto the top of columns is 12 m. Use mild steel for design of the tank. $17\frac{1}{2}$

3. Design a self-supporting steel chimney of height 50 m above foundation with diameter of cylindrical portion as 2·0 m. It has a 75 mm thick lining on the inside. $17\frac{1}{2}$

4. In a through type plate girder bridge, the effective span of a plate girder is 24 m. The support reaction due to dead load, live load and impact load is 1500 kN. The section of plate girder at support is shown in Figure 1. Design end bearing stiffners. Also design the necessary intermediate stiffners. $17\frac{1}{2}$

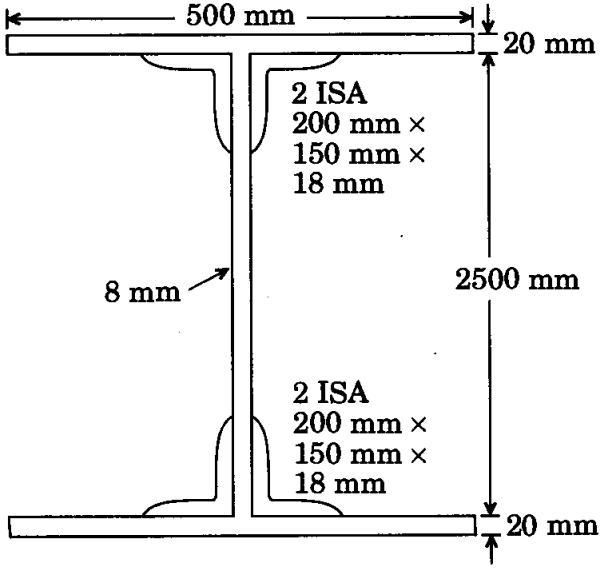

Figure 1

5. (a) A light gauge steel rectangular box section 200 mm × 100 mm × 2·0 mm is used for a column. The effective length of column is 3·6 m. Determine the safe load carrying capacity of the section. Take basic design stress = 125 N/mm^2. *12*

(b) Discuss the behaviour of stiffened elements under uniform compression. $5\frac{1}{2}$

6. Write short notes on the following : $17\frac{1}{2}$

(a) Functions of end bearings in steel bridges *5*

(b) Accessories of pressed steel tanks *5*

(c) Design procedure for light gauge steel tension members $7\frac{1}{2}$