

Total number of printed pages-4

43 (6) STR-VI

2016

STRUCTURE-VI

Paper : ENG-6.5

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill up the blanks with appropriate answer :

1×10=10

(i) Rolled steel beams are mainly employed to resist _____.

(ii) Size of rivets is expressed by _____ of the shank.

(iii) Gross diameter of a rivet is _____ to the diameter of the rivet hole.

Contd.

- (iv) _____ is the fusible material used in welding.
- (v) Oxy-Acetylene welding is a type of _____ welding.
- (vi) The members of a truss carrying tensile load are called _____.
- (vii) Distance of centre to centre of support in a truss is called _____.
- (viii) The distance between the adjacent trusses is called _____.
- (ix) The rivets which are heated and then driven in the field are known as _____.
- (x) The efficiency of a riveted joint is expressed in _____.

2. Answer **any five** of the following questions :
10×5=50

- (a) Write about the reasons of rivet connection becoming out of use. 10
- (b) What are the functions of the coating on the electrodes ? 10

- (c) Draw the various zones of a typical weld and level it. 10
- (d) What are the advantages and disadvantages of welded joints ? 10
- (e) What are the various types of welded joints ? Explain with diagram. 10
- (f) What are the different failures of a riveted joint ? Explain with diagram. 10
- (g) What is structural steel ? What are the advantages and disadvantages of steel sections ? 10

3. Answer **any two** of the following questions :
20×2=40

- (a) A double riveted double cover butt joint is used to connect plates 12mm thick. Using Unwin's formula, determine the diameter of rivets, rivet value, gauge and efficiency of joint. Adopt the following stresses —
- (i) Working stress in shear in power driven rivets = 100N/mm^2

(ii) Working stress in bearing in power driven rivets = 300N/mm^2

(iii) For plates working stress in axial tension = $0.6f_y$, $f_y = 260\text{N/mm}^2$

20

(b) Design a slab base for a column of ISHB 300 @ 58.8kg/m carrying an axial load of 1150kN . Take allowable bearing pressure on concrete as 4N/mm^2 . 20

(c) A simply supported beam of 8m span is subjected to an UDL of 50kN/m . The beam is laterally restrained. Design a rolled steel section for the beam. 20

(d) A rolled steel beam ISLB 550 @ 0.846kN/m carrying a total load of 35000kg uniformly distributed load is connected to a column ISWB 250 @ 0.4012kN/m . Design the connection.

20