Total number of printed pages–5

53 (CE 601) DGST-II

2019

DESIGN OF STRUCTURE-II

Paper : CE 601

Full Marks : 100

Time : Three hours

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

Answer ***any five*** *questions.*

1. *(a)* Write short notes on rigid, simple and semi-rigid joints. What are the advantages of bolted connections over riveted or welded connections ? 5+3=8

   (b) Write short notes on : 3+3=6

   (i) Lap joint

   (ii) Butt joint

   What are the advantages of butt joints over lap joints ?

Contd.

(c) Design a lap joint between two plates of size $100 \times 16\,mm$ thick and $100 \times 10\,mm$ thick so as to transmit a factored load of 120 kN using a single row of M20 bolts of grade 4.6 and 410 plates. 6

2. (a) Define groove welds. What are the various types of groove welds? What do you mean by partial penetration and full penetration groove weld? Which one is preferred and why? 7

(b) Why are fillet welds often adopted at site? Define plug and slot welds. Under what circumstances are slot and plug welds used? 6

(c) Design a connection to join two plates of size $200 \times 10\,mm$ of grade. Fe410 to mobilize full plate tensile strength using shop fillet welds, if *(i)* a lap joint is used *(ii)* a double cover butt joint is used. 7

3. (a) Define fillet weld. What do you mean by standard and special fillet welds? What are the different types of standard fillet, end fillet and side fillet weld? Define with figures diagonal fillet, and fillet and side fillet weld. 7

(b) A $10\,mm$ thick plate has been connected with the flanges of an I-section by applying $8\,mm$ fillet weld as shown in *figure* 1. A load of $120kN$ is placed eccentrically at a distance of $150\,mm$ from the flange. Check the safety of the joint. 13

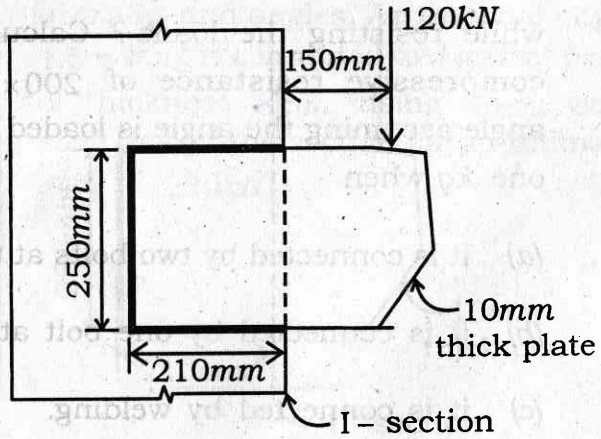

figure 1