Reg. No. : | | | | | | | | | | |

Question Paper Code: 36011

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Sixth Semester

Civil Engineering

01UCE601 - DESIGN OF STEEL AND TIMBER STRUCTURES

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

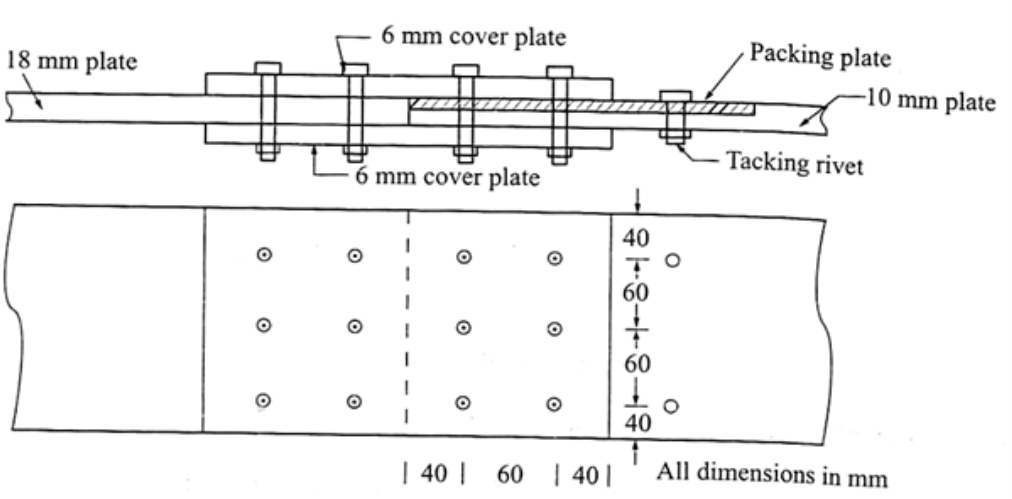
(Code book, Steel table are permitted)

PART A - (10 x 2 = 20 Marks)

1. Give any two advantages of steel structures.
2. Define efficiency of a joint.
3. Sketch the different shapes of tension members.
4. What is filler plate and what is its use?
5. What is meant by strut?
6. What is meant by column bases?
7. Define Slenderness ratio.
8. What is meant by plastic hinge?
9. What is flitched beam?
10. What is meant by decay of timber?

PART - B (5 x 16 = 80 Marks)

11. (a) Two cover plates, 10 *mm* and 18 *mm* thick are connected by a double cover butt joint using 6 *mm* cover plates as shown in figure. Find the strength of the joint. Given M20 bolts of grade 4.6 and Fe410 plates are used. (16)



Or

(b) Design a lap joint between the two plates each of width 120*mm*, if the thickness of one plate is 16*mm* and the other is 12*mm*. The joint has to transfer a design load of 160*kN*. The plates are of Fe410 grade. Use bearing type bolts. (16)

12. (a) Determine the tensile strength of a roof truss member 2ISA 9060, 6*mm* connected to the gusset plate of 8*mm* plate by 4*mm* weld. The effective length of weld is 200*mm*. (16)

Or

(b) Design a splice to connect a 300 x 20 *mm* plate with a 300 x 10 *mm* plate. The design load is 500 *kN*. Use 20 *mm* black bolts, fabricated in the shop. (16)

13. (a) Determine the design axial load capacity of the column ISHB300@577*N/m* if the length of the column is 3*m* and it's both end pinned. (16)

Or

(b) Design a gusseted base for a column ISHB 350 @ 710 *N/m* with two plates 450 *mm* x 20 *mm* carrying a factored load of 3600 *kN*. The column is to be supported on concrete pedestal to be built with M20 concrete. (16)

14. (a) Design a welded plate girder using Fe 415 steel for a span of 25 *m* to carry a load of 30 *kN/m*. (16)

Or

(b) Design a simply supported beam of effective span 1.5*m* carrying a factored concentrated load of 360 *kN* at mid span. (16)

15. (a) A column has to carry a load of 600 *kN*. Its effective height is 4.0 *m*. Design a built up solid wood column of deodar. (16)

Or

(b) Design a Teak wood floor beam having spacings of 3 *m* centers. The Span of the beam is 5 *m*. The dead load of span is 3 kN/m^2 and live load is 2 kN/m^2 and the beam is simply supported at both ends. (16)

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