

Code No: **R32013****R10****Set No. 1****III B.Tech II Semester Supplementary Examinations, November - 2017****DESIGN & DRAWING OF STEEL STRUCTURES****(Civil Engineering)****Time: 3 hours****Max. Marks: 75****Answer any ONE Question from Part – A
and any THREE Questions from Part – B****Use of IS 800-2007, IS-875 Part 3, Steel tables is to be permitted**

PART – A (30M)

- 1 Design a suitable web splice for a plate girder at a section at which the bending moment is $5000kN.m$ and shear force is $1000kN$. The plate girder is built-up from a web plate $2500mm$ deep $\times$ $16mm$ and two $ISA\ 200mm \times 150mm \times 15mm$ angles and a $600mm \times 16mm$ cover plate in each flange. The long legs of the flange angles are placed horizontally. [30M]

Draw:

- (i) The elevation of the web splice showing all the details and
(ii) Cross-section of the plate girder at web splice.

(OR)

- 2 Design a gantry girder to carry an electric overhead travelling crane for an industrial shed to suit the following data: [30M]
- (i) Crane load lifting capacity = $200kN$
(ii) Weight of crane excluding trolley = $150kN$
(iii) Weight of trolley = $75kN$
(iv) Distance between gantry rails = $20m$
(v) Minimum approach of crane hook = $1.2m$
(vi) Distance between centres of crane wheels = $3m$
(vii) Span of gantry girder = $6m$ 2 of 3
(viii) Weight of rail section = $0.3 \frac{kN}{m}$
(ix) Height of rail section = $75mm$
- Draw to scale the cross section and longitudinal section of the girder.

PART – B (3X15=45M)

- 3 a) A tie bar $120mm \times 10mm$ is to be connected to the other of size of $120mm \times 14mm$. [7M]
The tie bars are to be loaded by a pull of $120kN$. Find out the size of end fillets such that the stress in the end fillets is the same. Take the permissible stresses in the weld is $110 \frac{N}{mm^2}$.
- b) An $ISA\ 65mm \times 65mm \times 10mm$ carries a tensile load of $200kN$, applied along its centroidal axis. This angle is to be welded to a gusset plate. Find out the lengths of side fillet welds required at the heel and toe of the angle. [8M]

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