

BE Civil Engineering 4th Year 2nd Semester Examination, 2018(Old)

SUBJECT – Design of Metal Structures –II

Time: Three hours

Full Marks 100

Answer any four questions

(IS 875,800,1161 SP 6(1) and 806 are allowed in the hall )

1. Suggest a 20 m gantry girder section supporting a crane of 18 m span .The electrically operated crane has a weight of 550 KN and has two wheels on each gantry girder with a wheel base distance of 4.2 m on which a 350 KN crab moves carrying a lifting load of 500 KN .Check the section for bending. 25
2. Take a gantry girder section with the top flange 500 mm X 40 mm ,bottom flange 300 mm X 40 mm and web 1200 mm X 8 mm .The electrically operated crane has a weight of 450 KN and has two wheels on each gantry girder with a wheel base distance of 3.0 m on which a 450 KN crab moves carrying a lifting load of 450 KN. Design the bearing and intermediate stiffeners .Connection design is not required . 25
3. Design and detail a stepped column fixed at base and hinged at top .The crane and roof legs are 9 m and 3 m respectively .The column carries 60 KN and 700 KN vertical loads at roof and crane levels respectively and audl due to wind load of 4 KN/m throughout the column height. 25
4. A factory shed is 16 m wide , 28 m long , 4 m high upto eaves level and has 6.0 m overall height .The trusses along the shed are 4 m center to center .Assuming the shed to be constructed in Kolkata suggest a rafter – bracing general arrangement and design the members of the bracing system using hollow tubes . 25
5. Consider the data of problem 3. Assuming 2 - ISMB 450 @1200 mm c/c as the crane leg design and detail the base connection. 25