

B.Civil Engg.(Evening) 5th YEAR 1st SEMESTER (S) EXAMINATION, 2017

SUBJECT – Design of Metal Structures –II

(Name in full)

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 500 KN and has two wheels on each gantry girder with a wheel base distance of 4.0 m on which a 300 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 1000 mm X 8 mm . The electrically operated crane has a weight of 400 KN and has two wheels on each gantry girder with a wheel base distance of 2.5 m on which a 500 KN crab moves carrying a lifting load of 450 KN. Design the bearing and intermediate stiffeners .Connection design is not required . 25
3. A factory shed is 16 m wide , 32 m long , 4 m high upto eaves level and has 7.2 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
4. 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 40 KN and 850 KN vertical loads at roof and crane levels respectively and a udl due to wind load of 4 KN/m throughout the column height. 25
5. A factory shed is 16 m wide , 32 m long , 4 m high upto eaves level and has 7.2 m overall height .The trusses along the shed are 4 m center to center .Assuming the shed to be constructed in Kolkata suggest a tie – bracing general arrangement and design the members of the bracing system using hollow tubes . 25