

SUBJECT CODE:- 254
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CIVIL) Examination Nov/Dec 2015
Design of Structure - I (Steel)
(Revised)

[Time: Three Hours]

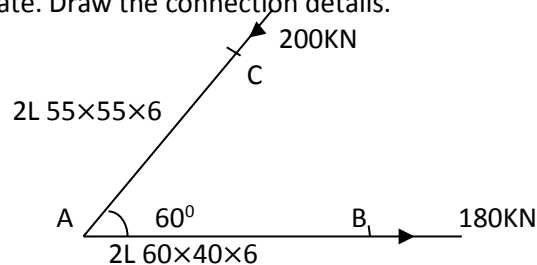
[Max. Marks: 80]

“Please check whether you have got the right question paper.”

- N.B i) Q.No.1 and Q.No.6 are compulsory.
 ii) Attempt any two questions from the remaining questions in sections A & B.
 iii) Use of IS 800 875, steel table & non-programmable calculator is permitted.
 iv) Assume suitable data, if necessary & mention it clearly.

Section -A

- Q.1 Answer the following (any five) 10
 a) What are the different types of welded joints?
 b) Draw the sketches of block shear failure.
 c) What are the different methods of design?
 d) Explain failure of bolted joint.
 e) Explain with sketches the pitch, gauge distance & edge distance.
 f) Explain with sketches the gusseted base.
- Q.2 Design a bolted connection of a truss joint as shown in fig.1. Using M16 black bolts of 4.6 grade. Use 10mm thick gusset plate. Draw the connection details. 15



- Q.3 a) A single angle member carries a factored axial force of 400kN. Design the tension member. 08
 b) Design the connection with a gusset plate and a lug angle for Q.3(a) 07
- Q.4 a) Design a built up column to support an axial load of 1200kN. The length of column is 6m with fixed at both ends. 08
 b) Design lacing or battering system for Q.4(a) 07
- Q.5 A column section ISHB 350@ 661.2 N/m carries an axial load of 1200kN. Design a suitable gusset plate base. Draw the details. 15

Section -B

- Q.6 Attempt any five 10
 a) Explain the concept of gantry girder
 b) State the various stiffeners used in plate girder.
 c) State the different type of loads acting on roof truss.
 d) Explain shear lag effect.
 e) Explain classification of beam section.
 f) State the components of a plate girder.
- Q.7 A simply supported beam has span of 6m laterally supported and it carries a load of 50kN at its center. Design 15

the beam.

- Q.8 A section of a plate girder consists of flange plates $600 \times 40\text{mm}$ and web plate $1800 \times 12\text{mm}$. determine the moment capacity of the section and the shear resistance of web buckling. Intermediate stiffeners are not provided. 15
- Q.9 Design a hand operated overhead crane, which is provided in a shed, whose details are as follows: 15
Capacity of crane = 50KN
Longitudinal spacing of column = 6m
Centre to centre distance of gantty girder = 12m
Spacing of wheel = 3m
Edge distance = 1m
Weight of crane girder = 40KN
Weight of trolley car = 10KN
- Q.10 Find the design force at joint P for the truss given below. Assume spacing of truss 4m , pitch = $\frac{1}{4}$ span, A.C. sheet, 15
wind load intensity normal to roof 1300N/m^2 . Calculate only dead load and live load acting at joint 'P'

