## <u>DEPARTMENT OF CIVIL ENGINEERING, UGMIT RAYAGADA</u> <u>VST 2022 (W)/5<sup>th</sup> sem/TH 2</u>

Full marks: 80

## Answer any Five questions including Q No. 1&2 IS -800 and Steel Table are allowed.

Time: 3 hours

## 1. Answer all questions:

[2x10

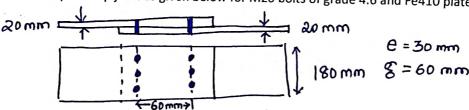
- a) What do you mean by rolled steel section?
- b) What are different types of load combinations?
- c) What do you mean by Fe250?
- d) What is density of steel?
- e) What is web buckling?
- f) What is web crippling?
- g) What is efficiency of a joint?
- h) What is HSFG bolts?
- i) What is slenderness ratio of a steel column?
- j) What do you mean by block shear?

## 2. Answer any SIX questions:

[5x6

- a) Briefly explain principles of Limit State Design Method.
- b) Explain different terminology ,spacing and edge distance of bolt holes by neat diagram.
- c) Write down advantages and disadvantages of steel structures.
- d) Briefly explain design steps of tension members.
- e) Briefly explain design steps of compression members.
- f) Briefly explain design steps of steel beams.
- g) Explain common cross sections and classifications of steel beams.

3. Find the efficiency of a lap joint as given below for M20 bolts of grade 4.6 and Fe410 plates. [10



- 4. A tie member of roof truss consists of 2 ISA 10075,10 mm . The angles are connected to either side of a 10 mm gusset plates and member is subjected to working pull of 400kN.Design the welded connection.
- 5. Design a double angle tension member connected on each side of a 10 mm thick gusset plate to carry an axial factored load of 400kN.Use 20 mm black bolts. [10
- 6. Design a single angle strut connected to gusset plate to carry 200kN factored load. The length of strut between centre to centre connection is 3m. [10
- 7. Design a simply supported beam of effective span of 2m carrying a factored concentrated load of 400 kN. [10