

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: B.ARCH
BRANCH: ARCHITECTURE**

**SEMESTER: VI
SESSION : SP/2019**

SUBJECT : AR6309 STEEL STRUCTURES

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
 2. Candidates may attempt for all 30 marks.
 3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. The missing data, if any, may be assumed suitably.
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- Q1 (a) Determine the plastic section modulus about the major axis (z_{pz}) for ISMB 225 @ 306.07 N/m. [5]
(b) Determine the collapse/ultimate load for a simply supported beam of span L, carrying a concentrated load W at mid span using (i) static & (ii) kinematic method. [5]
- Q2 A double bolted double cover butt joint is used to connect two plates which are 8 mm thick. Assume 16 mm diameter bolts of grade 4.6 & cover plates to be 6 mm thick. Calculate strength & efficiency of the joint, if four bolts are provided in two lines with two bolts in each line at a pitch of 45 mm. Draw the plan & sectional elevation of the joint showing all details. [10]
- Q3 (a) A plate 210 mm x 8 mm is used as a tension member in a lattice girder. It is connected to a 10 mm thick gusset plate by M16 bolts of grade 4.6. Calculate effective net area of the member if 12 bolts are connected in chain bolting with 4 bolts in each line. Draw relevant labeled figures. [5]
(b) Determine the effective net area of ISA 100 mm x 75 mm x 10 mm with both its leg connected to a gusset plate with fillet welds. Draw relevant labeled figures. [5]

::: 05/03/2019 :::::E