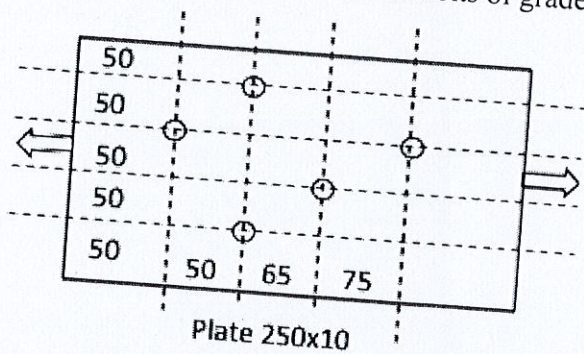*Dr. Kaushal Kumar*

COURSE CODE: 10B11CE611
COURSE NAME: Design of Steel Structures
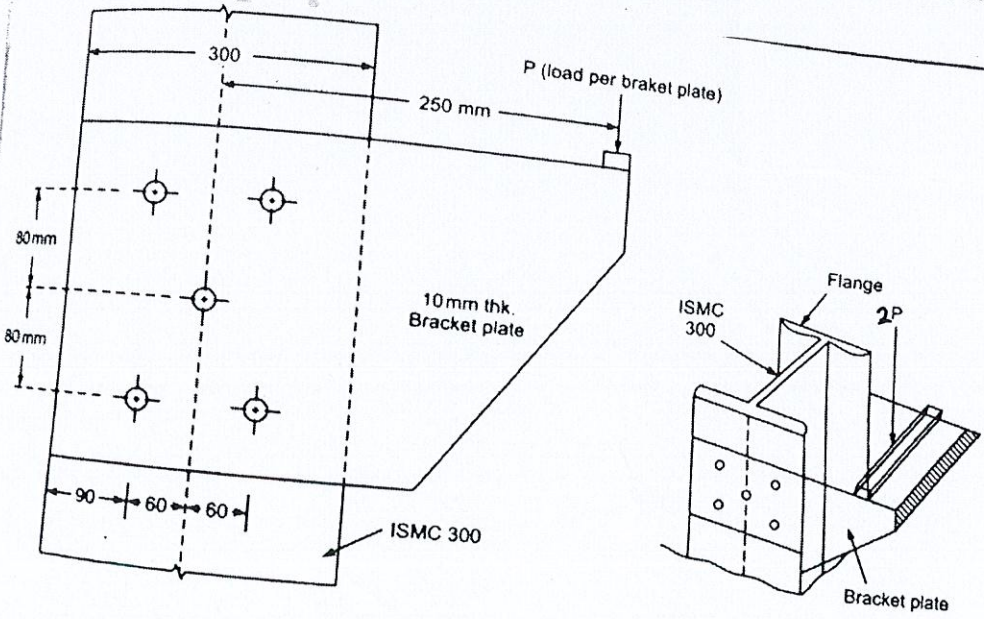COURSE CREDITS: 4

MAX. MARKS: 15

MAX. TIME: 1 Hr

Note: (i) *All questions are compulsory.*
(ii) *Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. Explain with the help of neat sketches the various types of failures of connection. **[2 Marks]**

Q2. Determine the strength of the plates in tension (M20 bolts of grade 4.6) **[3 Marks]**

Plate 250x10

Q3. Design a lap joint between the two plates each of width 120mm, if the thickness of one plate is 16mm and the other is 12mm. The joint has to transfer a design load of 160 KN. The plates are of Fe410grade.Use black bolts of grade 4.6. Also find its efficiency. **[5 Marks]**

Q4. A bracket plate bolted to a vertical column is loaded as shown in figure. If M20 bolts of grade 4.6 are used, determine the maximum value of factored load 'P' which can be carried safely.

[5Marks]

------------------End------------------