

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY,
WAKNAGHAT

TEST – 3, 17-12-2021 02.30PM – 04.30PM

BTech 6th Semester Civil Engineering

Course Code: 18B11CE515

Max. Marks: 35

Course Name: DESIGN OF CONCRETE STRUCTURES

Max. Time: 2hr

Course Credits: 04

Note: All questions are compulsory. Marks are indicated against the questions. Carrying of mobile phone is strictly prohibited and will be treated as case of unfair means. IS 456 is allowed to be carried.

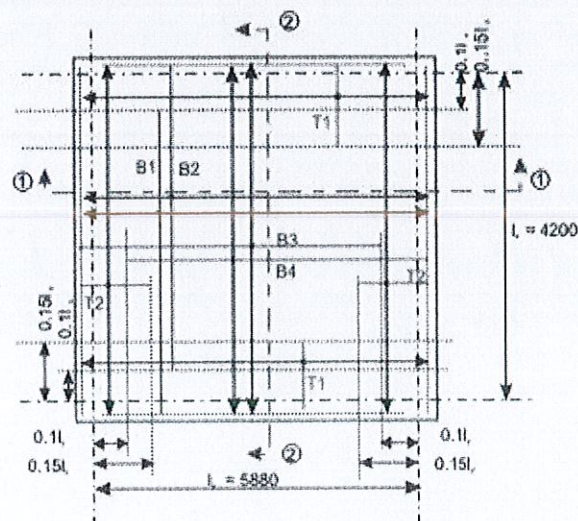
Q.1 Elaborate on the procedure with neat diagrams to develop design charts for short rectangular reinforced concrete column. Mentions all necessary steps with strain and stress profiles, along with the codal guideline for check. [7]

Q.2 What do you understand by following terms, explain in detail:

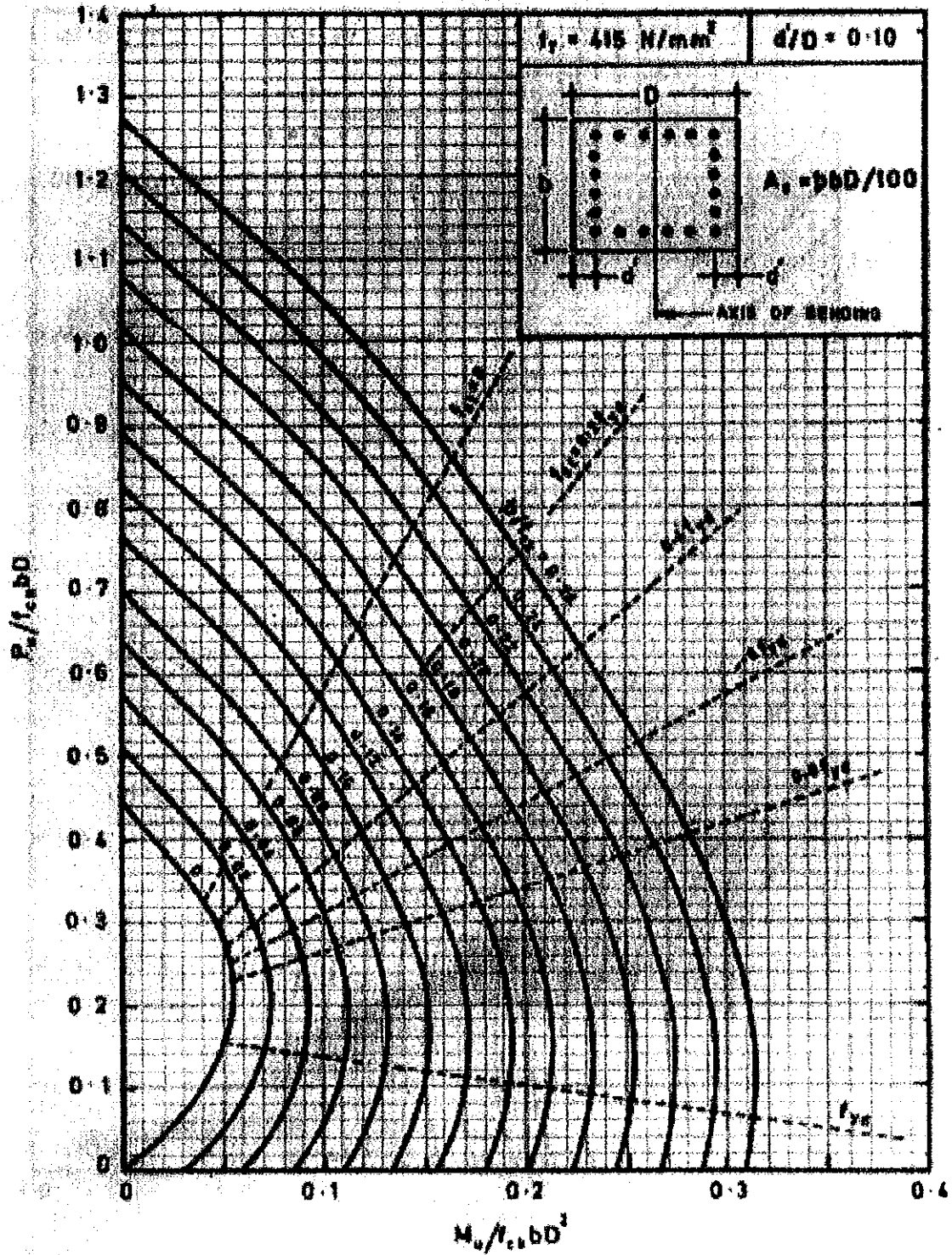
- Development length
- Types of torsion
- Limit state of serviceability
- Creep in concrete
- Short term deflection in reinforced concrete member

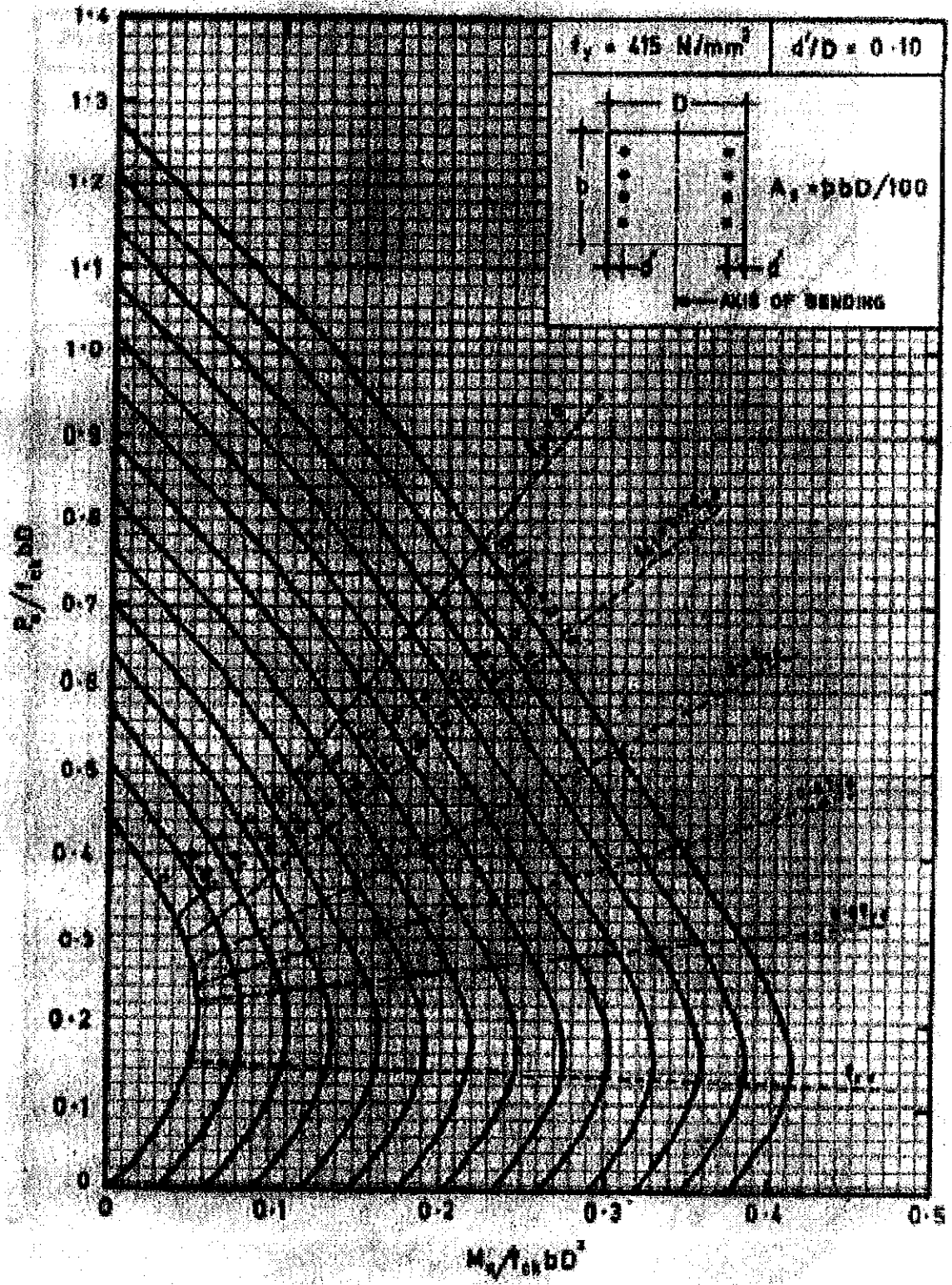
[5]

Q.3 Design a two-way simply supported slab as shown in figure below, not having adequate provision to resist torsion at corners and to prevent the corners from lifting. The factored live load is 6 kN/m^2 and the load of the floor finish in 1 kN/m^2 . The spans shown in the figure are effective spans. Use M 20 and Fe 415. The width of the support is 300 mm. Assume any other data if needed, show cross-sections 1-1 and 2-2 after design with help of a neat diagram [10]



Q.4 Determine the reinforcement of grade Fe415 steel required for a square column of size 400X400 mm subjected to a factored direct load and a factored moment of 2000kN and 250kNm respectively, with an effective cover of 40mm. consider two cases (a) Reinforcement is to be placed on two sides (b) reinforcement is to be placed on all four sides. Use M20 concrete mix, SP 16 charts are attached here with. [6]





Q.5 Determine the steel reinforcement of a simply supported flanged beam with $D_f = 100 \text{ mm}$, $D = 700 \text{ mm}$, cover = 50 mm, $d = 650 \text{ mm}$, $b_w = 300 \text{ mm}$, spacing of the beams = 4000 mm c/c, effective span = 10 m and imposed loads = 10 kN/m². Use M 20 and Fe 415. Assume any other data if needed.

[7]

