UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA
Internal Assessment
4th Semester-– 2022(Summer), Civil Engg.

Th.1 : Structural Design-I
(IS-456 Code is allowed)

Full Mark: 20 Time: 1 hour

1. Answer any FIVE (2×5=10)

a. Differentiate between balance section and over rein forced section in concrete structure.
b. Define percentage of steel (pt).
c. Define neutral axis constant in WSM.
d. Define Moment of Resistance of a beam section.
e. State the characteristics strength of a structure as per IS code.
f. Draw the stress -strain diagram of a doubly reinforced beam section.
g. Draw the stress-strain diagram of mild steel.

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2. Answer any TWO (5×2=10)

a. State the assumptions made in flexure of beam as per IS -456 code.
b. Derive the expression for position of neutral axis and moment of resistance for a balanced rectangular section and compute the same for M20 concrete and Fe500 grade steel.
c. Design the shear reinforcement of beam of length 7m and size 300 mm x 560 mm (d) with udl of 50 kN/m acting overall the span. Assume any other data if required.
d. Design a rectangular section which carries a maximum limiting bending moment of 85 kNm . Use M20 concrete and Fe415 steel.

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