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B TECH
(SEM V) THEORY EXAMINATION 2018-19
DESIGN OF CONCRETE STRUCTURE - I

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably. IS:456-2000 original allowed.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. What is the characteristic strength of steel?
b. What do you understand of Limiting depth of Neutral Axis?
c. What checks we do while designing of a RCC Beam?
d. What is the loads act on slab?
e. Draw the reinforcement diagram with bent up bars of one way slab.
f. How can we prevent effect of shear?
g. Define Shear strength of Concrete and bond stress.
h. What is the minimum reinforcement in slabs?
i. Define Long term deflection.
j. Draw the sketch for column with helical ties with sectional plan and sectional elevation.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. A rectangular beam of width 350mm is subjected to a UDL of 15KN/m over an effective span of 8 mtr. Determine the depth required for the beam and also calculate the area of tension reinforcement .Use M20 concrete and fe415 steel By WSM.
b. A rectangular beam 20cm wide and 40cm deep upto the tension reinforcement .find the area of reinforcement required if it has to resist a moment of 25KNm. Use M20 concrete mix and Fe415steel. By LSM
c. Design a simply supported slab for a room 7.5m x3.5 m clear in size .The slab is carrying an imposed load of 5KN/ m^2. Check for development length.
d. Determine the reinforcement required for a beam of size 300mm x600mm subjected to a factored BM of 150Knm, factored SF 100KN, factored torsional moment of 50KNm.Use M20 concrete and Fe415steel. Draw the details.
e. Design a short RCC column to carry an axial load of 1600KN. It is a 4 mtr long effectively held in position and restrained against rotation at both ends. Use M20 concrete and Fe415 steel .Draw also sketch.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) A concrete beam 300mm x450 mm effective is reinforced with 4-25mm dia. bars on tension side. Find MOR if M20 concrete and Fe415 steel used.
(b) Draw the figure of different type of RCC beam section and Explain.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) An RCC beam is required to carry a UDL of 25KN/m inclusive of its self-weight .the effective span of the beam is 8 mtr Design the beam for flexure and check for deflection. Draw the sketch. Use M20 concrete and Fe415

(b) A Simply supported RCC beam 250mm wide and 450mm deep effective is reinforced with 4-18mm dia. bars. Design the beam for Shear reinforcement use M20 concrete and Fe415 steel and beam is subjected a SF 150KN at service Load.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Determine factored MOR of a beam 230mm x460mm effective .The beam is reinforced with 2-16mm diameter bar on compression side and 4-20mm diameter bar on tension side .The compression bar are placed at a distance of 40mm from top .Use M20concrtete and Fe415 steel.

(b) What do you understand by term Equivalent Shear force and Equivalent Bending Moment?

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain Method of Calculating long Term Deflection.

(b) Design a reinforced concrete slab for a hall measuring 8mx16m.The slab is supported on RCC beams 250mm wide and spaced at 4mtr c/c. The superimposed load is 4KN/m^2 Use M20 Concrete and Fe415 steel. Bearing of Beam is 200 mm. Check for Deflection.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Design a column of size 450mm X600mm and having 3mtr unsupported length .the column is subjected to a load of 2000Kn and is effectively held in position but not restrained against rotation .Use M20 concrete and Fe415steel. Draw the sketch.

(b) What is the interaction Curve? Explain the failure of a column subjected to compression and Uniaxial bending with help of interaction curve.