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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**I Year M.Tech II Semester (R16) Regular Examinations May/June 2017****ADVANCED REINFORCED CONCRETE DESIGN**

(Structural Engineering)

(For Students admitted in 2016 only)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 X 12 =60 Marks)

UNIT – I

- Q.1** a. Briefly explain the bar spacing rules for beams with regard to cracking. 5M
 b. A simply supported beam having 5m span is 400mm x 650mm in cross section. The bending moment at the mid span is 300KNm, out of which 40% is due to permanent loads. Calculate the design surface crack width under a bar on the tension face? 7M

OR

- Q.2** a. Explain the moment – curvature relationships of reinforced concrete sections. 5M
 b. Draw maximum bending moment diagram for a fixed ended beam carrying 15KN/m load at collapse. The span of the beam is 6m. 7M

UNIT – II

- Q.3** a. What is a deep beam? Mention the I.S. Code provisions with regard to deep beams. 4M
 b. Design a single span deep beam to suit the following data :
 Effective Span = 6m, overall depth = 6m, width of support= 0.6m
 Width of beam = 0.4m
 Total load on the beam including self weight = 400KN/m
 Use M₂₀ grade concrete and Fe₄₁₅ grade steel. 8M

OR

- Q.4** Design a corbel to carry a factored load of 500KN at a distance of 200mm from the face of a 300mm x 300mm column. Use M₃₀ grade concrete and Fe₄₁₅ grade steel. Sketch the reinforcement details. 12M

UNIT – III

- Q.5** Find Suitable dimensions of a simply supported slab of span 6.5m to be made from structural hollow clay blocks 300x300x250mm height with 200mm wall thickness. Determine the reinforcement required if the slab is to carry an imposed load of 4.0 KN/m²? 12M

OR

- Q.6** Write short notes on the following
 (a) Ultimate moment of Resistance in ribbed slabs. 6M
 (b) Design criteria for shear in ribbed slabs. 6M

UNIT – IV

- Q.7** An R.C. grid floor is to be designed to cover a floor area of 12m x18m. The spacing of ribs in mutually perpendicular directions is 1.5m c/c. Live load on the floor is 2KN/m^2 . Using M_{20} grade concrete and Fe_{415} grade steel, analyse the grid floor by IS: 456 – 2000 method and design suitable reinforcements in the grid floor. 12M

OR

- Q.8** Design the interior panel of a flat – slab floor system for a ware house 24m x24m divided in to panels of 6m x 6m. 12M
- Loading = 5KN/m^2
 Materials = M_{20} grade concrete & Fe_{415} grade steel
 Column Size = 400mm diameter
 Sketch the Reinforcement details.

UNIT – IV

- Q.9** a. Explain braced and un-braced concrete walls. 6M
 b. Explain the rules for detailing of steel in concrete walls. 6M

OR

- Q.10** A bar bell type shear wall with central part 3600 x 150mm and two 400 x 400mm strong bands at each ends is supported on a footing 8m x 4m which rests on soil whose modulus is $30,000\text{KN/m}^3$. Determine the lateral stiffness of the wall? Assume $f_{ck} = 20$ and height of the wall is 14m. 12M

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