GUJARAT TECHNOLOGICAL UNIVERSITY
BA – SEMESTER – 4 - EXAMINATION – SUMMER 2018

Subject Code: 1045003   **Date: 17-May-2018**
Subject Name: Structure-IV
Time: 10.30AM TO 12.30PM   **Total Marks: 50**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks**.
4. **Use of IS –456 (2000) and SP-16 is permitted**

Q.1	**(a)** Explain Briefly: Working state method.	[4]
	(b) (i) Calculate design compressive strength of M 25 concrete (ii) Find modulus of elasticity of M 25 concrete (iii) Calculate design strength of Fe 415 steel.	[6]
Q.2	**(a)** A singly RC beam has effective dimension of 250mm X 450mm. It is reinforced with 3-20mm dia. of Fe 415. Find out moment of resistance of beam. Use M20	[5]
	(b) A doubly reinforced beam of 300mm X 600mm overall is reinforced with 4-20mm dia. bars as compression reinforcement and 6-20mm dia. bars as tensile reinforcement. Effective cover on both sides is 50mm. M-25 grade of concrete and Fe-415 grade of steel bar is used. Compute moment of resistance	[10]

OR

Q2.	**(b)** A short R.C.C column of size 300mm X 400mm is reinforced with 6 bars of 20mm dia. Determine the safe load column can carry if M-20 grade of concrete and Fe 250 steel is used. Also find the spacing of lateral ties and draw required sketch.	[10]
Q.3	**(a)** Write Difference for Balanced sections, Under reinforced section, Over reinforced section.	[5]
	(b) Design and detail two way simply supported slab of 2.5m x 3.75m. 150 mm thick slab is supported by 350 mm thick brick wall and live load on slab is 3.0 kN/sqm. Take value of αx & αy from IS 456. Take M20 and Fe 415 grade of material.	[10]

OR

Q.3	**(a)** Differentiate between one way and two way slabs	[5]
	(b) Design a one way continuous slab having three equal spans of 3.5 m effective with following data. (1) Imposed load = 4 kN/ m2 (2) Floor finish = 1 kN/ m2 (3) Concrete M-20 and steel Fe-250 grade. Sketch the design details	[10]
Q.4	**(a)** Design an isolated square pad footing for the RCC column of size 400 mm x 400 mm to transmit axial load of 850 kN. The safe bearing capacity of soil is 180 kN/ m2. Use M-20 concrete and Fe-415 steel. No check for shear is required. Sketch the details	[10]

OR

Q.4	Design a slab for office room of 3.2 m x 8.5 m size. The slab is resting on 300 mm thick wall and resisting live load of 2.5 kN/m2 . Use M-20 concrete mix and Fe-415 steel. Check the slab for control of deflection. Sketch details	[10]

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