

Code No: R1622351

R16**SET - 1****II B. Tech II Semester Regular Examinations, November- 2018****THEORY OF STRUCTURES**

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Write a short note neutral axis and types (3M)
- b) Explain about modular ratio for compression steel (2M)
- c) Write a short note on development of length (2M)
- d) Write down different types of loading on slabs (2M)
- e) Differentiate between long and short column (3M)
- f) Write about classification of foundations (2M)

**PART -B**

2. a) A Singly reinforced concrete beam 350mm wide and 450mm depth is reinforced by 5-16 $\phi$  steel bars. If maximum permissible stresses for concrete and steel are 10 N/mm<sup>2</sup> and 200 N/mm<sup>2</sup>. Determine the safe moment of resistance of section adopt  $m=20$  and cover 50mm (10M)
- b) Briefly discuss about the properties of reinforced concrete (4M)
3. a) Explain briefly about location of neutral axis and shear failures of beams without reinforcement (5M)
- b) A beam 250x450mm is reinforced with 2-16mm dia at top & 4-22mm dia at the bottom each at an effective cover of 38mm. If safe stresses in material are 5N/mm<sup>2</sup> & 140N/mm<sup>2</sup>. Find the stress in concrete surrounding compression steel.  $m=19$  (9M)
4. A rectangular beam of size 300 x 600mm overall depth is supported over a simply supported span of 6.2m and is subjected to a live load of 50KN/m. If reinforcement provided for tension is 8-25mm dia for compression is 4-20mm dia. Design the beam for shear. Use M25 grade concrete Fe250 steel and  $\sigma_{sv}$  is 140 N/mm<sup>2</sup>. Take  $\tau_c = 0.51$  N/mm<sup>2</sup> and  $\tau_{max} = 1.9$  N/mm<sup>2</sup> (14M)
5. a) Write the Design steps for one way slab (5M)
- b) A T beam of flange width 1000mm & flange thickness 100mm, rib width 250mm has an effective depth of 500mm. The beam is reinforced with 4-22mm dia. Find the ultimate moment of resistance. Use M20 concrete and Fe250 Steel (9M)
6. Design a slab for a room size 3.5m x 4.5m subjected to live load of 4KN/m<sup>2</sup>. Use M30 Concrete and Fe415 steel. Consider edges of slab are simply supported and corners are not held down. Take  $\alpha_x = 0.093$  and  $\alpha_y = 0.055$  (14M)

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7. a) Write step wise procedure involved in design of RCC footing for concrete wall. (6M)
- b) Determine the active earth pressure on the retaining wall as shown in the figure (8M)  
and also draw the pressure distribution diagram and also calculate the magnitude and direction of the total pressure.

