KERALA AGRICULTURAL UNIVERSITY

B.Tech.Food Engg. 2014 Admission

Vth Semester Final Examination-February -2017

Cat. No: Cien. 3105 **Marks: 50**

Title: Design of Structures (1+1) **Time : 2 hours**

I. Fill up the blanks/ True or False : **(10 x 1=10)**

1. A section in which the quantity of steel provided is different from what is required is ---------
2. Vertical shear reinforcement are called ---------
3. Deflection of a beam shall not exceed ---------
4. The lateral pressure on the walls of a bunker is determined by ---------
5. The floor area is always --------- than carpet area.
6. A singly reinforced beam is a beam provided with longitudinal reinforcement in the tension zone only.
7. A simply supported slab may be supported on all its four sides.
8. Revised estimate is prepared when the expenditure of a work exceeds more than 10%.
9. A lap joint may fail by the crushing of the plate at the back of the rivet.
10. The size of the butt weld is specified by the throat thickness.

II. Write short notes/answers on ANY FIVE: **(5x 2=10)**

1. Bond stress.
2. Plinth area estimate.
3. Make a sketch of single riveted single cover butt joint.
4. Ferro cement.
5. Singly reinforced beam.
6. Two way slab.
7. Sketch the types of bending of bars.

III Write answers on ANY FIVE: **(5 x 4=20)**

1. Discuss the types of failure of riveted joints.
2. Explain the design procedure of a one way slab.
3. Sketch the types of butt welds.
4. Design a suitable section for a strut of 2m carrying a load of 40000N. Assume both ends pinned.
5. Explain the design procedure of a tension member.
6. Calculate the position of neutral axis of a singly reinforced beam for the following data. Width of beam=300mm, Effective depth=450mm area of steel =400mm^2. M_{20} concrete.
7. Find the area of steel required for a concrete short column 400x400mm carrying an axial load of 1250 kN. Assume suitable data.

IV. Write essay on any ONE **(1 x 10=10)**

1. Find a suitable pitch for a double riveted lap joint, for plate 10mm. Use 20mm diameter rivets. Also determine the efficiency of the joint.
2. Design a rectangular singly reinforced beam for the following requirements. Clear span=4.50m, Live load=60 kN/m 300mm bearing at the ends. Use M_{20} concrete and torsteel.

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