KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Food. Engg. & Tech.) 2018 Admission
V Semester Final Examination-February 2021

Cien.3105 **Design of Structure (1+1)** **Marks: 50**
Time: 2 hours

I **State True or False** **(10x1=10)**

1. Fe-410 steel has minimum tensile strength of 410 N/mm².
2. Minimum pitch distance for bolted connection is 1.5 times of dia. of bar.
3. A member subjected only to axial tension is supposed to be most economical structural element.
4. The strength of the tension member depends upon the net area.

Fill in the Blanks

5. The Indian standard code which deals with steel structures is _____.
6. When two plates are placed end to end and are joined by two cover plates, the joint is known as _____.

Define the Following

7. Characteristic strength of concrete.
8. Under-reinforced section.
9. Partial factor of safety.
10. Flanged beam.

II **Write Short notes on any FIVE of the following** **(5x2=10)**

1. Explain Flexural Buckling
2. Explain edge distance
3. State over-reinforced section
4. Draw neat sketch of built-up battened column
5. Define Fe250, Fe415 and Fe500
6. Differentiate between short and long column
7. Define sinking fund

III **Answer any FIVE of the following.** **(5x4=20)**

1. The two plates of 20 mm and 18 mm thickness are to be joined by a groove weld. The joint is subjected to a factored tensile force of 430 kN. Due to some reasons the effective length of the weld that could be provided was 180 mm only. Check the safety of the joint if single V groove weld is provided.
2. Draw the neat sketch of different types of bolted joints and explain anyone.
3. A 6 mm thick angle section is jointed to a 10 mm thick gusset plate. The angle is supporting a load of 55 kN. Find out the number of 16 mm diameter power driven rivets.
4. A short R.C.C. column 450 x 450mm is reinforced with 8 bars of 20 mm diameter. The effective length of column is 2.75 m. Find the ultimate load for the column. Use M20 concrete and Fe 250 steel.
5. Explain methods of calculating depreciation.
6. State steps for design of RCC one way slab.
7. Differentiate between market value and book value.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. A reinforced concrete beam is simply supported over a span of 5 m and it carries a

uniformly distributed load of 25 kN/m including its own weight. If the size of beam is restricted to 300 mm x 500 mm, determine the area of tension and compression steel if required. Use M20 concrete and Fe-415 steel. Assume effective cover to steel as 40 mm.

2. A T- beam has a flange width of 1200 mm, a flange thickness of 100 mm, an effective depth of 600 mm, and a rib width of 275 mm. It is reinforced with 6 bars of 25 mm diameter and 4 bars of 16 mm diameter. Find ultimate moment of resistance. Use M20 grade concrete and Fe – 415 grade steel.

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