KUMARAGURU
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Register Number: ……

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fifth Semester

CIVIL ENGINEERING

CEE112: Basic Structural Design (Timber, Masonry & Steel)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following is used as weathering coarse?

   a) Cement b) Timber

   c) Coarse Aggregate d) Brick

2. The nominal size of counry brick is

   a) 190 x 90 x 90 mm b) 190 x 190 x 90 mm

   c) 100 x 50 x 60 mm d) 230 x 110 x 90 mm

3. Which one is type of wood?

   a) Plywood b) Sal

   c) Shear d) gypsum board

4. What is the density for patak wood?

   a) 865 kg/m^3 b) 520 kg/m^3

   c) 350 kg/m^3 d) 400 kg/m^3

5. Which one is not a channel section

   a) ISMB b) ISJC

   c) ISLC d) ISMC

6. The partial safety factors for steel is

   a) 1.5 b) 1.15

   c) 1.2 d) 1.3

7. The density of steel is

a) 7850kg/m^3 b) 8750kg/m^3

c) 5780kg/m^3 d) 5870kg/m^3

8. What is the condition for pitch distance for compression member?

a) 16t b) 12t

c) 14t d) 18t

9. What is the minimum size of weld?

a) 3mm b) 5mm

c) 7mm d) 10mm

10. The ultimate tensile strength and yield strength of clause 4.8 respectively, are

a) 320N/mm^2,420N/mm^2 b) 450N/mm^2,240N/mm^2

c) 400N/mm^2,240N/mm^2 d) 410N/mm^2,250N/mm^2

PART B (10 x 2 = 20 Marks)

11. What are the factors to be considered in design of Brick Masonry?
12. Define slenderness ratio of a masonry wall.
13. Classify the timber according to its treatability.
14. What are the various types of joints adopted to be in timber?
15. What is meant by lug angles?
16. Sketch neatly single and double lacing systems.
17. What is a tension splice?
18. Determine the bolt value of 20mm diameter bolt connecting 12mm plates and is in double shear.
19. What is meant by web crippling?
20. State the location where bearing stiffeners are to be placed.

PART C (5 x 14 = 70 Marks)

21. a) A compression member is made up of 150mm x 60mm deodar wood. The member is 2m long. The member is subjected to a compressive load of 20kN and a moment of 650Nm. Check whether the section is safe.

(OR)

b) Design a simply supported beam using deodar wood to carry a load of 1.5kN/m for a span of 3m.

22. a) Determine the allowable axial load on a brick pier of 300mm x 400mm with crushing strength of brick 7.5MPa using cement mortar 1:5 Height and brick pier is 3.5m.

(OR)

b) A brick masonry wall of a single room building is 200mm. It has R.C. slab on top and bottom. Height of room is 3m length of wall between cross wall is 4m. Using bricks of 10Mpa crushing strength and M1 Grade mortar. Calculate the load carrying capacit of wall per metre.

23. a) Design a single bolted double cover butt joint to connect boiler plates of thickness 12mm for maximum efficiency. Use M16 bolts of Grade 4.6. Boiler plates are of Fe410 grade. Find the efficiency of the joint.

(OR)

b) A tie member consists of two ISMC 250. The channels are connected on either side of a 12mm thick gusset plate. Design the welded joint to develop the full strength of the tie. However the overlap is limited to 400mm.

24. a) A tension member is made of ISA 90x90x10mm connected to 10mm gusset plate with 5 numbers of 20mm diameter bolts with 65mm pitch and 45mm edge distance. Calculate the load carrying capacity of the member in tension.

(OR)

b) Design a column for the following data.
Axial load of the column : 600kN
Length of the column : 3.7m
End conditioned Hinged- Hinged

25. a) Design a beam of 5m effective span, carrying a load of 20kN/m, if the compression flange is laterally unsupported. Assume fy = 250 MPa.

(OR)

b) Design a laterally supported beam to carry load of 15kN/m for an effective length of 12m. Use steel of grade Fe410.

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