KUMARAGURU
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Register Number:…….

B.TECH. DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Third Semester

TEXTILE TECHNOLOGY

U13CET311: Basics of Civil Engineering and Mechanics

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. ___ is the dimension of a standard brick
   a) 9 cm x 9 cm x 9 cm
   b) 19 cm x 9 cm x 9 cm
   c) 9 mm x 9 mm x 9 mm
   d) 19 mm x 9 mm x 9 mm
2. A chain is used to measure ___.
3. Roof with sloping top surface is known as ___.
   a) sloped roof
   b) tapered roof
   c) pitched roof
   d) inclined roof
4. For hill areas ___ flooring is more suitable.
5. Factor of safety is the ratio between ___
   a) elastic limit and ultimate stress
   b) working stress and breaking stress
   c) breaking stress and ultimate stress
   d) working stress and ultimate stress
6. According to ___, within the elastic limit stress is directly proportional to strain
7. Cantilever beam has ___ fixed end(s) and ___ free end(s).
   a) one , zero
   b) one, one
   c) zero, two
   d) two, zero
8. ___ is the point at which bending moment becomes zero.
9. When a plate of 100 mm long, 20 mm width and 3 mm thick is simply bent inward, the outer most layer is subjected to ___
   a) tensile stress
   b) compressive stress
   c) no stress at all
   d) shear stress
10. The formula to compute the power transmitted by a shaft is ___.

PART B (10 x 2 = 20 Marks)

11. Name atleast four commercial forms of steel sections used in construction.
12. What is the need for reinforcement in RCC?
13. List out various types of trusses used in roofs.
14. How to differentiate long column from short column?
15. Why temperature stress is developed and what are the influencing factors?
16. A cylindrical rod of length 100 mm and diameter 10 mm is subjected to a tensile force. It was found that when length gets extended by 4 mm its diameter reduced by 0.2 mm. Compute the Poisson's ratio.
17. Show the shear force diagram of a cantilever beam of 60 mm long when subjected to a point load of 20 N at its free end.
18. Classify beams.
19. Write the bending equation and name the notations used in it.
20. List any two assumptions made in theory of torsion.

PART C (5 x 14 = 70 Marks)

Q.No. 21 is Compulsory

21. The following perpendicular offsets were taken at 10 m intervals from a survey line to an irregular boundary line.
3.15 m, 4.30 m, 8.20 m, 5.60 m, 6.85 m, 7.60 m, 4.20 m, 5.60 m and 4.30 m.
Calculate the area enclosed between the survey line, the irregular boundary line, and first and last offsets, by the application of: a) average ordinate rule b) trapezoidal rule and c) Simpson's rule

22. a) i) Define foundation. List the types and explain various functions of a good foundation. (8)
ii) Show the components of a bridge and mark each part on it. (6)

(OR)

b) i) Compare brick masonry with stone masonry. (10)
ii) State any four qualities of a good brick. (4)

23. a) The following observations were made during a tensile test on a mild steel specimen 40 mm in diameter and 200 mm long.
Elongation with 40 kN load (within limit of proportionality): 0.304 mm

Yield load: 161 kN

Maximum load: 242 kN

Length of specimen at fracture: 249 mm

Determine: (i) Young's modulus (ii) Yield point stress (iii) Ultimate stress and (iv) % elongation

(OR)

b) A beam weighing 450 N is held in a horizontal position by three vertical wires, one attached to each end of the beam, one to the middle of its length. The outer wires are of brass of diameter 1.25 mm and the central wire is of steel of diameter 0.625 mm. If the beam is rigid and wires are of same length and unstressed before the beam is attached, estimate the stresses induced in the wires. Take Young's modulus of brass as 86 GN/m^2 and for steel 210 GN/m^2.

24. a) Draw the shear force and bending moment diagrams for a cantilever beam loaded as shown in **Figure 1**.

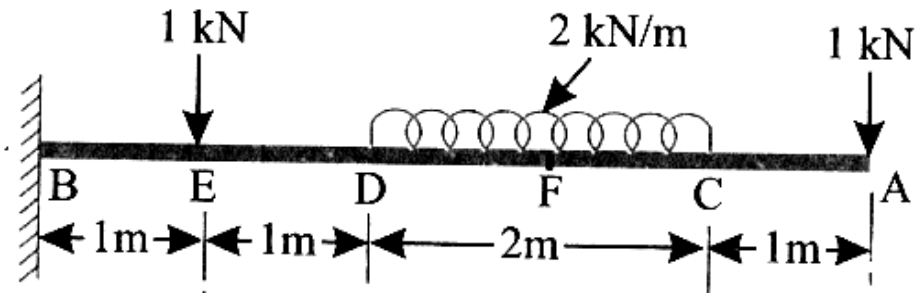

Figure 1

(OR)

b) Draw the shear force and bending moment diagrams for a beam loaded as shown in **Figure 2**. Clearly mark the maximum bending moment and determine its value.

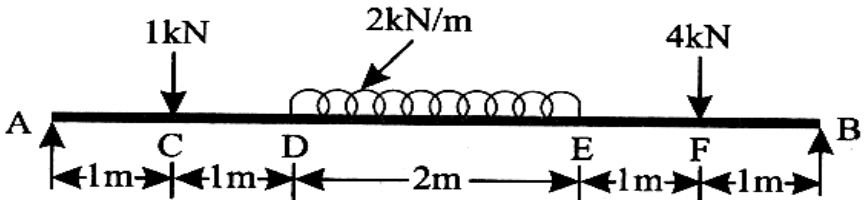

Figure 2

25. a) A T-section of 100 mm (flange) x 150 mm (web) x 20 mm (web thickness)is subjected to a shear force of 100 kN. Show the shear stress distribution and find the maximum shear stress.

(OR)

b) A shaft has to transmit torque of 30 kNm. The maximum shear stress is not to exceed 100 MPa and the angle of twist of 1º per meter length. Take G = 80 GPa. Design the shaft according to the given specifications if it is a (i) solid circular shaft and (ii) hollow circular shaft of internal diameter 90% of the external diameter.

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