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**Question Paper Code: 44104**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Civil Engineering

14UCE404 - MECHANICS OF SOLIDS - II

(Regulation 2014)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

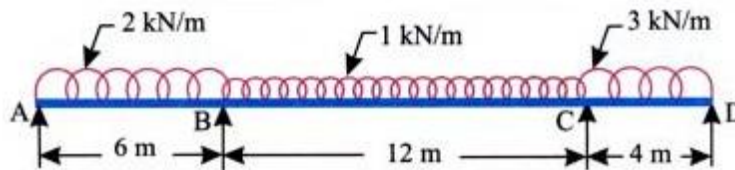
- The strain energy stored by the body within elastic limit when loaded externally is called
  - Resilience
  - Proof resilience
  - Modulus of resilience
  - None of these
- In case of solid shaft the strain energy in torsion per unit volume is equal to
  - $\tau^2 / 2C$
  - $\tau^2 / 4C$
  - $\tau^2 / 6C$
  - $\tau^2 / 8C$
- A beam of length 6 m carries a point load 120 kN at its centre. The beam is fixed at both ends. The fixing moment at the ends is
  - 40 kNm
  - 90 kNm
  - 120 kNm
  - 150 kNm
- A continuous beam has
  - One support
  - two support
  - more than two supports
  - very long span
- The maximum deflection of a fixed beam carrying a central point load lies at
  - fixed ends
  - centre of beam
  - 1/3 from fixed ends
  - none of these

6. A beam of length  $L$ , fixed at both ends, carries a point load  $W$  at its centre. If  $EI$  is the flexural rigidity of the beam, the maximum deflection in the beam is  
 (a)  $WI^3/48EI$       (b)  $WI^3/192EI$       (c)  $WI^3/96EI$       (d)  $WI^3/24EI$
7. Lamé's theorem deals with the design of  
 (a) long column      (b) short column      (c) thick cylinder      (d) beams
8. In water bound macadam roads, binding material, is  
 (a) Sand      (b) Stone dust      (c) Cement      (d) Brick dust
9. The maximum spacing of contraction joints in rigid pavements is  
 (a) 2.5 m      (b) 3.5 m      (c) 4.5 m      (d) 5.5m
10. In a thick cylinder the Stress distribution across the wall thickness will be  
 (a) linear      (b) parabolic      (c) hyperbolic      (d) cubic

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Describe the factors governing highway alignment. (8)
12. Analyse the beam shown in figure and draw the B.M diagram. (8)



13. Design of flexible pavements: Which is located in hilly area present traffic intensity is 350 vehicles for a design period of 8 years and a traffic growth rate of 7.5% take lane distribution factor as 0.75 take VDF 2.5; design of CBR value for soil subgrade is 10%. (8)
14. Explain the various sub surface drainage system with neat sketches. (8)
15. A beam of Tee section having flange of 100 mm x 20 mm and web of 150 mm x 10mm and 3 m long is simply supported at its ends. It carries 4 kN at 30 ° to vertical and passing through the centroid of the section. Calculate the maximum tensile stresses and maximum compressive stresses.  $E = 200 \text{ kN/mm}^2$ . (8)