Q.P. Code: 16CE111 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B Tech II Year II Semester Supplementary Examinations October-2020

STRENGTH OF MATERIALS-II

(Civil Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 The stresses at a point in a bar are 200 N/mm^2 (tensile) and 100 N/mm^2 (compressive). Use graphical method; determine the resultant stress in magnitude and direction on a plane inclined at 60^o to the axis of the major stress. Also determine the maximum intensity of shear stress in the material at the point. **12M**

OR

2 The normal stress in two mutually perpendicular directions are 600N/mm^2 and 300N/mm^2 both tensile. The complimentary shear stresses in these directions are of intensity 450N/mm^2. Find the normal, tangential stresses on the two planes which are equally inclined to the planes carrying the normal stresses mentioned above. **12M**

UNIT-II

3 A thick spherical shell of 200 mm internal diameter is subjected to an internal fluid pressure of 7N/mm^2. If the permissible tensile stress in the shell material is 8N/mm^2, find thickness of the shell. **12M**

OR

4 A copper cylinder, 90cm long, 40cm external diameter and wall thickness 6mm has its both ends closed by rigid blank flanges. It is initially full of oil at atmospheric pressure. Calculate additional volume of oil which must be pumped into it in order to raise the oil pressure to 5 N/mm^2 above atmospheric pressure. For copper assume E= 1.0 x 10^5 N/mm^2 and Poisson's ratio 1/3. Take bulk modulus of oil as K=2.6x10^3 N/mm^2. **12M**

UNIT-III

5 A masonry dam of rectangular section, 20m high and 10m wide, has water upto a height of 16m on its one side find: **12M**

i) Pressure force due to water on one meter length of the dam

ii) Position of centre of pressure

iii) The position at which the resultant cuts the base and

iv) Maximum and minimum intensities at the base of the dam. Take weight density of masonry is 19.62 kN/m^3 and of water 9.81 kN/m^3

OR

6 A line of thrust, in a compression testing specimen 15mm diameter, is parallel to the axis of the specimen but is displaced from it. Calculate the distance of the line of thrust from the axis when the maximum stress is 20% greater than the mean stress on a normal section. **12M**

UNIT-IV

7 **a** What are the assumptions made in Euler's column theory **4M**

b A round steel bar of 16mm diameter and 2m length is subjected to a gradually increasing axial compressive load. Determine the buckling load, safe load when FOS=4 and also the maximum deflection when both the ends are fixed. Take E=2x10^5 MPa. **8M**

OR

8 Derive an Euler's load expression for the column with one end fixed and the other end hinged. **12M**

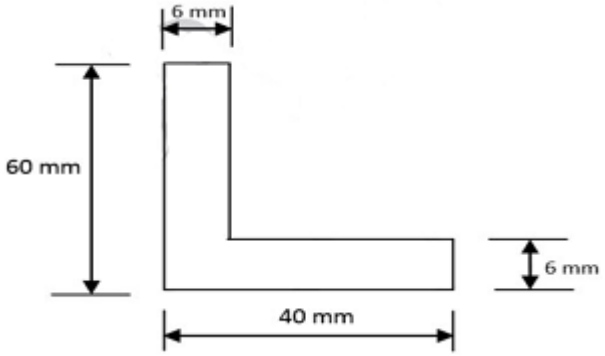
UNIT-V

9 **a** What is unsymmetrical bending? **2M**

b Determine the principal moments of inertia for an unequal angle section 200x150x10 mm. **10M**

OR

10 Determine the principal moment of inertia for unequal angle section 60×40×6 mm shown in figure below. **12M**



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