9. Explain the following : 15

(i) Hoop stress and longitudinal stress in case of thin cylinder

(ii) Wire winding of thin cylinders

Roll No. .....

3114

B. Tech. 4th Semester (ME) Examination – July, 2021

STRENGTH OF MATERIALS

Paper : PCC-ME-206-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Briefly answer the following : $2.5 \times 6 = 15$

(a) Define Mohr circle.

(b) Define Bulk modulus.

(c) What do you mean by neutral axis ?

(d) Explain Maxwell's reciprocating theorem.

(e) Define Helical spring.

(f) Explain moment area method to find deflection.

UNIT – I

2. Explain the following : 15

(i) Principle stress and principle plane.

(ii) Major and minor principle stress.

3. Derive the relationship between various elastic constants in details. 15

UNIT – II

4. Draw the shear force and bending moment diagram of the cantilever beam as shown in figure 1 : 15

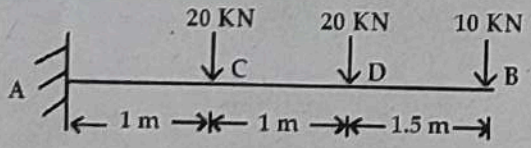

Figure 1

5. A circular pipe of external diameter 70 mm and thickness 8 mm is used as a simple supported beam over an effective spam 2.5 m. Find the max. concentrated load that can be applied at the centre of spam if permissible stress in the tube is 150 N/mm^2. 15

UNIT – III

6. Explain the following : 15

(i) Euler's formula for the elastic buckling load.

(ii) Slenderness ratio.

7. Find the maximum deflection and the maximum slope for the beam as shown in figure 2 : 15

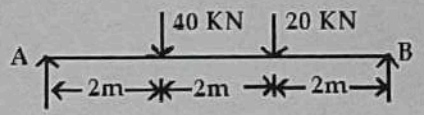

Figure 2

UNIT – IV

8. Derive torsional equation and assumptions in the theory of torsion. 15