Total No. of printed pages = 3

CT-303/SOM/3rd Sem/2016/N

STRENGTH OF MATERIALS

Full Marks – 70

Pass Marks – 28

Time – Three hours

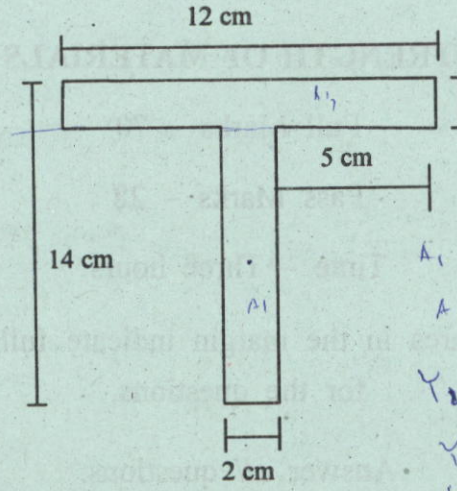
The figures in the margin indicate full marks for the questions.

Answer *all* questions.

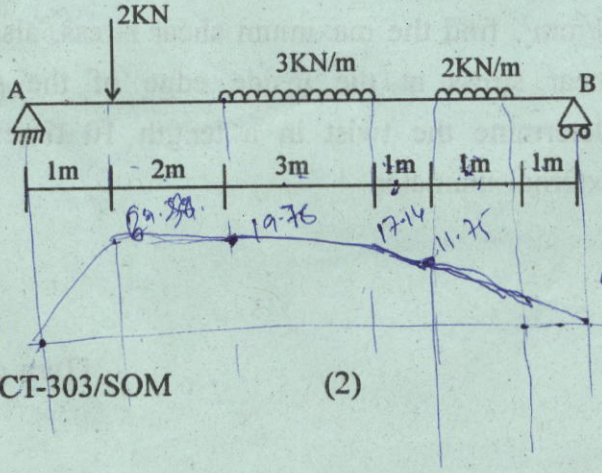
1. A hollow shaft of 40 cm external diameter and 20 cm of internal diameter is subjected to a twisting moment of 400 MN-mn. If N = 80,000 N/mm^2, find the maximum shear stress, also the shear stress at the inside edge of the shaft. Determine the twist in a length 10 times the external diameter. 14

[Turn over

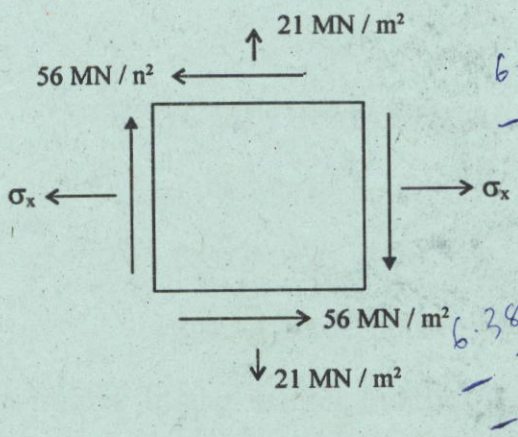
2. The T-section is a simply supported beam over a span of 4 metres. It carries a uniformly distributed load of 8000 N/m over its entire span. Calculate the maximum compressive and tensile stress in the section. 14



3. Draw bending moment diagram for the figure. 14



4. If the minimum principal stress is -7 MN/m^2, find σ_x and the angle which the principal stress axes make with X-Y axes : 14



5. Write notes of the following terms :

(a) Stress, strain and their types. 5

(b) Stress-strain diagram for mild steel. 5

(c) Hooke's law, Poisson's ratio, Young's modulus, Bulk modulus. 4