



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B. Tech
Branch Code: MEC	Pattern: 2023
Name of Course: Solid Mechanics	Course Code: 2305213
Max. Marks: 30	Duration: 1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last column indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

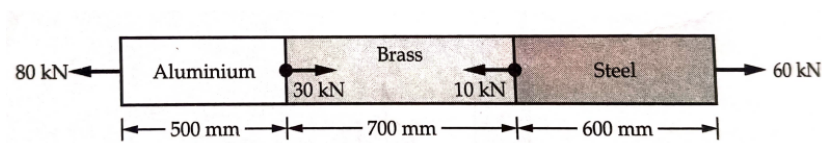
Marks CO

Question No. 1

- 1 a) Explain Hooke's Law and its significance in material deformation, determine δl from Hooke's law. (7) CO1

Question No. 2

- 2 a) Determine the elongation of the composite bar of uniform cross-sectional area of 300mm^2 loaded as shown in figure. Take $E_{al} = 70\text{GPa}$, $E_{br} = 105\text{GPa}$ and $E_{st} = 200\text{GPa}$. (8) CO1

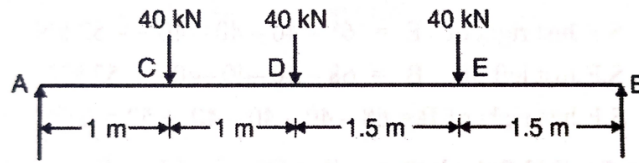


OR

- 2 b) A mild steel rod of 20mm diameter and 300mm long is enclosed centrally inside a hollow copper tube of external diameter 30mm and internal diameter 25mm. The ends of the rod and tube are brazed together and the composite bar is subjected to an axial pull of 50kN. If E for steel and copper are 200GPa and 100GPa respectively. Find the stresses developed in the rod and tube. (8) CO1

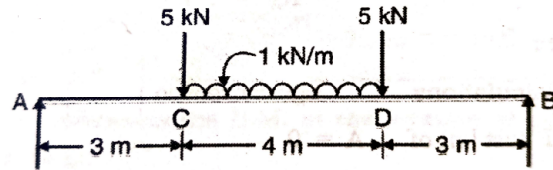
Question No. 3

- 3 a) Draw the shear force and bending moment diagrams for the beam shown in the figure. Indicated on the diagrams the values of shear force and bending moment at significant points Find maximum bending moment. (7) CO2



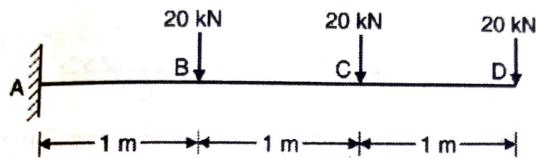
Question No. 4

- 4 a) Draw SFD and BMD, including all the values at important points. (8) CO2



OR

- 4 b) Find the reaction at the fixed end of the cantilever loaded as shown in figure. Draw FD and BMD. (8) CO2



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