

School of University Polytechnic

**Diploma in Mechanical Engineering
Semester End Examination - Jun 2024**

**Duration : 180 Minutes
Max Marks : 100**

Sem IV - N1DL403B - DPME2008 - Mechanics of Solid

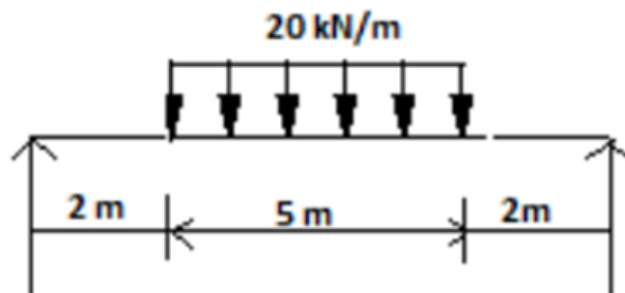
General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

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| 1) | State Hooke's law. | K1(2) |
| 2) | Quote the expressions for polar modulus of solid and hollow circular shaft. | K2(4) |
| 3) | Draw stress strain curve for mild steel and explain its salient points. | K2(6) |
| 4) | Make use of graphical method draw the Mohr's Circle for two normal and tensile stresses. | K3(9) |
| 5) | Construct the shear force and bending moment diagram for a simply supported beam having length 5m acted by a point load at mid span with magnitude 50kN. | K3(9) |
| 6) | Draw shear force and bending moment diagram for the given beam. | K5(10) |



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| 7) | Obtain an expression for deflection of a simply supported beam carrying UDL throughout its span. | K4(12) |
| 8) | The normal stresses acting on two perpendicular planes at a point in a strained material are 70 MN/ m ² tensile, 35 MN/ m ² compressive. In addition, shear stress of 40 N/mm ² act on these planes. Calculate the following: i)The magnitude of the principal stresses. (ii). The direction of the principal planes. (iii)The magnitude of the maximum shear stress. | K5(15) |
| 9) | Conclude maximum shear stress theory. | K5(15) |
| 10) | Formulate the expression of strain energy for impact load. | K6(18) |