GIET UNIVERSITY, GUNUPUR – 765022

RD19MTECH080

Registration No: | | | | | | | | | | |

Total Number of Pages : 01 M.TECH

AR-19

M.TECH 1ST SEMESTER EXAMINATIONS NOV/DEC 2019

MD, MPEMD1054

ADVANCED MECHANICS OF SOLIDS

Time: 3 Hours Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A (10 X 2=20 MARKS)

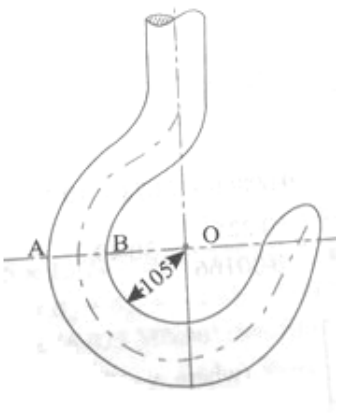
1. Answer the following questions.

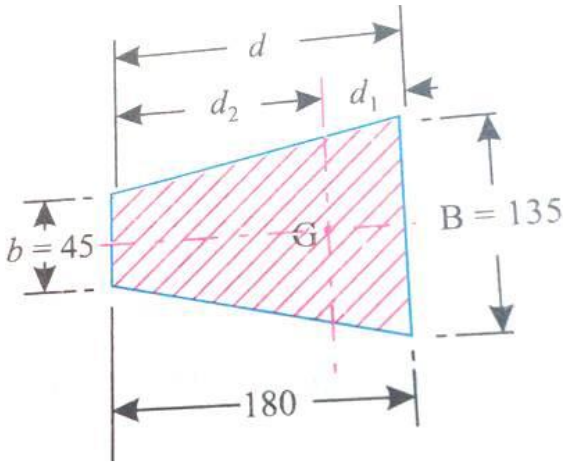
a. State the reasons for unsymmetrical bending.
b. What do you mean by beams on elastic foundation? Give one example.
c. Distinguish between state of plane stress and state of plane strain?
d. Write down Winkler-batch formula. Name each term. Where it is used?
e. What is meant by lame's theory of thick cylinder? State the assumptions of lames theory.
f. How Euler's beam is differing from Timoshenko beam?
g. What do you mean by membrane analogy for thin walled tube?
h. State Hamilton's principle?
i. Explain St. Venant's principle?
j. Define Harmonic Excitation of a system?

PART-B (5 X 10=50 MARKS)

Answer any five questions from the following.

2. Locate the shear centre for the channel section.
3. What do you mean by columns. Derive the Euler's formula for columns with pinned ends.
4. Fig shows a crane hook lifting a load of 150KN.Determine the maximum compressive and tensile stresses in the critical section of the crane hook.





5. If the displacement field is given by **u** = [y2**i** + 3yz **j** + (4 + 6x2)**k**]10–2, what are the rectangular strain components at the point P(1, 0, 2)?
6. Derive the differential equation of equilibrium for 3D state of stress on a body in rectangular co-ordinate system.

7. Write the assumption made in deriving the Winkler batch formula for curved beam?
8. Write short notes on

a) Virtual work
b) Compatibility equation

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