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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations Nov/Dec 2019

ENGINEERING MECHANICS

(Common to CE, AGE & ME)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|---|----|
| 1 | a What are the types of Trusses. | 2M |
| | b Classify different types of Friction. | 2M |
| | c Define the center of mass. | 2M |
| | d What is Radius of Gyration. | 2M |
| | e What are the types of vibrations. | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

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|---|---|-----|
| 2 | Equilibrium equations for concurrent force system in space. | 10M |
|---|---|-----|

OR

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| 3 | A screw jack raises a load of 40 KN. The screw is square threaded having 3 threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from axis of screw, if coefficient of friction between screw and nut is 0.12. | 10M |
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UNIT-II

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| 4 | a State laws of friction. | 6M |
| | b Explain Cone of Friction with a neat sketch. | 4M |

OR

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| 5 | To determine centroid for the rectangle lamina, having a width of "b" and height of "h". | 10M |
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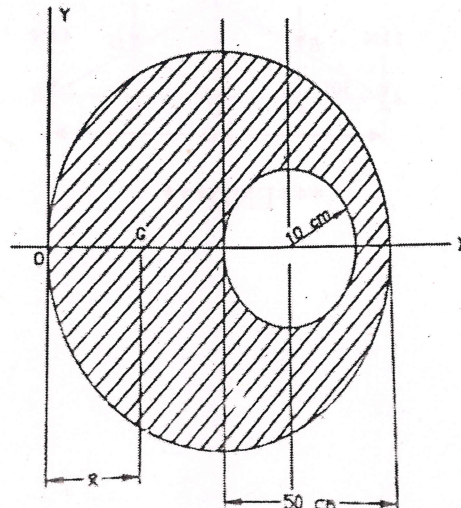
UNIT-III

- | | | |
|---|--|-----|
| 6 | Derive the expression for mass moment of inertia of a homogeneous sphere of radius 'r' and mass density 'w', with reference to its diameter. | 10M |
|---|--|-----|

OR

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| 7 | Determine the centroid of the remaining portion of a circular sheet of metal of radius 50cm when a hole of 10cm radius is taken out from the Centre of the circular disc along its horizontal diameter as shown in figure. | 10M |
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P.T.O

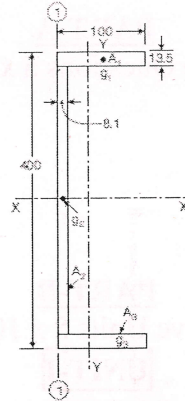


UNIT-IV

8 Derive the expression for mass moment of inertia of a cone of height 'h' and base radius 'r' and mass density 'w' with respect to its geometrical axis. 10M

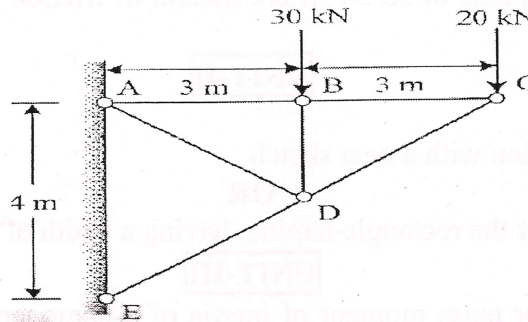
OR

9 Compute the second moment of area of the channel section shown in Figure about centroidal axis x-x and y-y. 10M



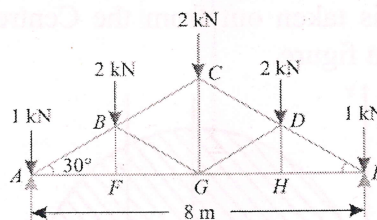
UNIT-V

10 Determine the forces in each member of the truss and state if the members are in tension or compression 10M



OR

11 A king post truss of 8 m span is loaded as shown in Figure. Find the forces in each member of the truss and tabulate the results. 10M



END