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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R16) Regular Examinations June 2017
ENGINEERING MECHANICS
(CE & ME)
(For Students admitted in 2016 only)

Time: **3 hours**

Max. Marks: **60**

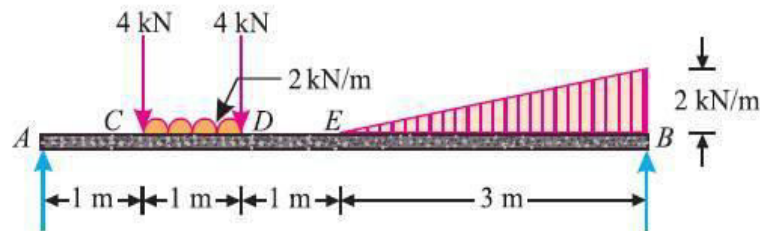
(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

- 1 a. What do you understand by action and reaction? Give examples 6M
 b. The following forces act at a point
 i) 20N inclined at 30° towards north of East
 ii) 25N towards North
 iii) 30N towards North West, and
 iv) 35N inclined at 40° towards South of West
 Find the magnitude and direction of the resultant of force 6M

OR

- 2 a. Derive the expressions of parallelogram law of forces. 5M
 b. A simply supported beam AB of 6 m span is subjected to loading as shown in Fig. Find the support reactions at A and B.



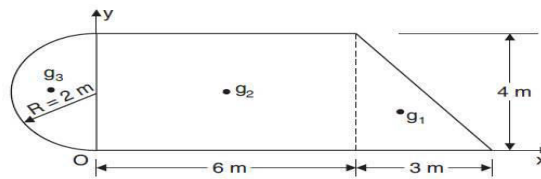
7M

UNIT-II

- 3 a. What is the screw jack? What are the applications of it? 4M
 b. What is the differential screw jack? Explain the working principle of screw jack with neat sketch. 8M
- OR**
- 4 a. A body of weight 500N is pulled up on an inclined plane, by a force of 350N. The inclination of the plane is 30° to the horizontal and the force is applied parallel to the plane. Determine the coefficient of friction. 6M
 b. The force required to pull a body of weight 50N on a rough horizontal plane is 15N. Determine the coefficient of friction If the force is applied at an angle of 15° with the horizontal 6M

UNIT-III

- 5 Determine the centroid of the area shown in Fig with respect to the axis shown



12M

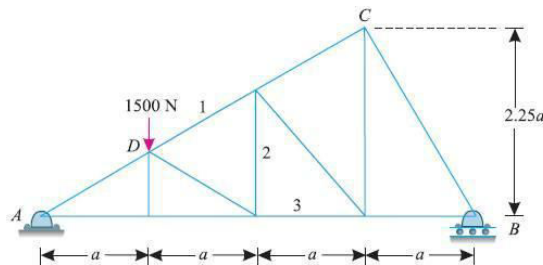
OR

- 6 Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch.

12M

UNIT-IV

- 7 A plane is loaded & supported as shown in fig. Determine the nature and magnitude of the forces in the members 1, 2 and 3.



12M

OR

- 8 Explain the procedure to find forces in members of truss by using method of joints.

12M

UNIT-V

- 9 A car moves along a straight line whose equation of motion is given by $s = 12t + 3t^2 - 2t^3$, where (s) is in metres and (t) is in seconds. Calculate (i) velocity and acceleration at start, and acceleration, when the velocity is zero

12M

OR

- 10 A stone is thrown from the top of building upward at an angle of 40° with the horizontal with an initial speed of 30 m/sec. The height of the building above ground level is 30 m. Determine:
- The greatest height reached by the stone above the ground level.
 - The horizontal distance from the point of projection to the point where the stone strikes the ground.
 - The velocity with which the stone strikes the ground.
 - Time of flight

12M

***** END *****