Reg. No: ☐☐☐☐☐☐☐☐☐☐

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R16) Supplementary Examinations Dec 2017
ENGINEERING MECHANICS
(CE & ME)

Time: **3 hours**   Max. Marks: **60**

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

UNIT-I

1 a. Explain the term 'support reactions'. What are the different types of supports?   6M

   b. What is the difference between a roller and a hinged support?   6M

OR

2 a. State and prove Lami's theorem.   4M

   b. Define the following terms
         a) Overhanging beam
         b) Reaction
         c) Concurrent forces
         d) Vector quantities
   e) Lami's theorem   8M

UNIT-II

3   Find the least force required to drag a body of weight W, placed on a rough inclined plane having inclination α to the horizontal. The force is applied to the body in such a way that it makes an angle θ to the inclined plane and the body is
    (a) On the point of motion up the plane,
    (b) On the point of motion down the plane.   12M

OR

4   Define the following terms
         A) Limiting force of friction
         B) Co-efficient of friction
         C) Angle of friction
         D) Angle of repose
         E) Cone of friction   12M

UNIT-III

5   A semicircle of 90 mm radius is cut out from a trapezium as shown in   12M

Fig. Find the position of the centre of gravity of the figure.
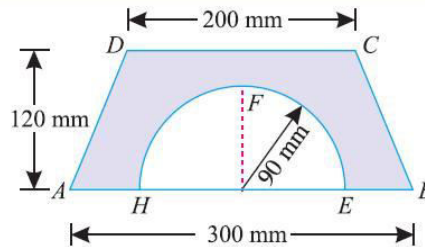
OR

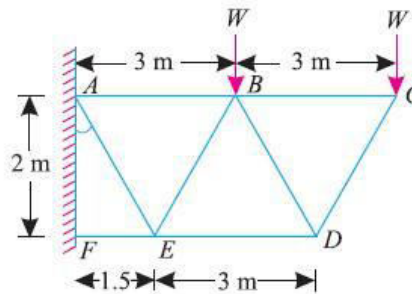6   Describe the method of finding out the moment of inertia of a
composite section   12M

UNIT-IV

7   A cantilever truss is loaded as shown in Fig. Find the value W,
which would produce the force of magnitude 15 kN in the member
AB.

12M

OR

8   Explain the procedure to find forces in members of truss by using
method of sections.   12M

UNIT-V

9   A small steel ball is shot vertically upwards from the top of building
50 m above the street with an initial velocity of 25 m/sec.
    (i) In what time, it will reach the maximum height?
    (ii) How high above the building will the ball rise?
    Compute the velocity with which it will strike the street and
    the total time for which the ball is in motion.   12M

OR

10   The equation of motion of a particle moving in a straight line is
given by $s = 18t + 3t^2 - 2t^3$ where (s) is in metres and (t) in
seconds. Find (1) velocity and acceleration at start, (2) time, when
the particle reaches its maximum velocity, and (3) maximum
velocity of the particle.   12M

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