

Div  
C88 D

Samarth Samaj's  
SHIVAJIRAO S. JONDHALE COLLEGE OF ENGINEERING  
At- Sonarpada, Dombivali (E)

Mid-Term Test 2014-15      Applied Mechanics      Marks: 20      Time: 60 mins

**Important Instructions:**

Question no 1 is compulsory.

Each Sub-Question of 1-A carries two marks.

Each Sub-Question of 1-B carries one mark.

Students have to attempt any three from the remaining five.

Each question from Questions no. 2 to 6 carries five marks.

Use of non-programmable calculator is allowed.

Assume suitable data wherever necessary and justify the same.

1). A). Answer any two. (4)

1. List all the equations that can be used to solve curvilinear motion problems.  
Explain each term/quantity. (2m)

2. With an example, explain the Constant String Length Method (CSLM) for  
analyzing dependent motion. (2m)

3. Differentiate between uniform acceleration and variable acceleration motion. (2m)

1). B). Explain any one in detail.

1. Projectile motion. (1m)

2. Centroid.

2). Two ships A & B leave a port at the same time. A travels at 36 kmph in the North-West direction while B travels at  $50^\circ$  south of west at 27 kmph.

a) Determine the relative velocity of B w.r.t. A. 275.658.

b) After how much time will the two ships be 120 km apart?

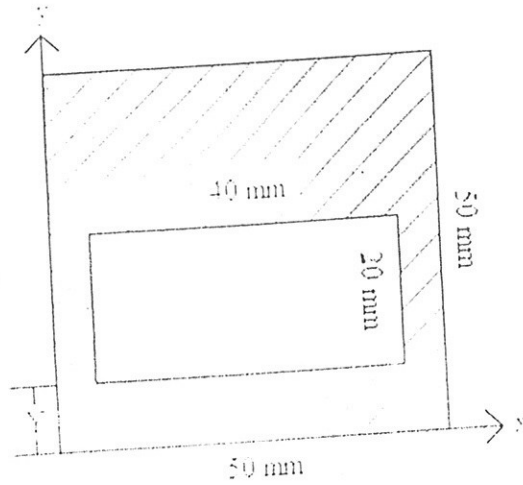
3). Prathamesh throws a ball so that it may clear a wall 3.6 m high. He is at a distance of 4.8 m from the wall. The ball is to hit the ground at a distance of 3.6 m on the other side of the wall. Find the least velocity with which Prathamesh can throw the ball.

278.49.

5

4). A stone is released from the top of a tower. During the last second of its motion, it covers  $1/4^{\text{th}}$  of the height of the tower. Find the height of the tower.  $h = 23.054 \text{ m}$ .

5). Find distance 'Y' so that the C.G. of given shaded area has coordinates (25, 20) mm.



25, 20

(5M)

6). A Mercedes Benz starts from rest and travels along a straight track such that it accelerates at a constant rate for 10 seconds. Then it decelerates at a constant rate. Both these values are given in the figure. Draw the v-t and s-t graphs and determine the time T needed to stop the car. How far has the car travelled? The values in the figure are in S.I. units.

