No. of Printed Pages : 4

BET-014

DIPLOMA IN CIVIL ENGINEERING (DCLE(G)) / DIPLOMA IN ELECTRICAL AND MECHANICAL ENGINEERING (DEME) / DCLEVI / DMEVI / DELVI / DECVI / DCSVI / ACCLEVI / ACMEVI / ACELVI / ACECVI / ACCSVI

Term-End Examination

June, 2016

00980

BET-014 : APPLIED MECHANICS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Assume suitable data wherever necessary. Use of calculator is permitted.*

1. Two forces are acting at a point as shown in Figure 1. Determine the magnitude and direction of the resultant (R) choosing the x and y axes as shown and resolving the forces P and Q along these axes. *14*

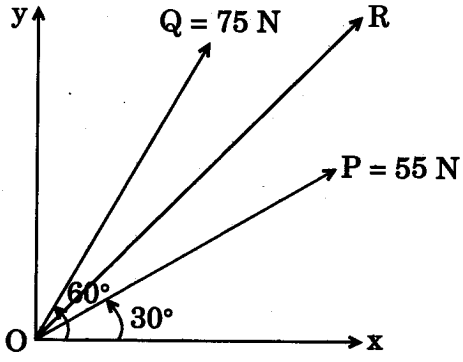

Figure 1

2. A bar AB of length $2l$ and negligible weight rests on two roller supports C and D placed at a distance l apart. For the reactions at the supports to be equal, find the distance x, of the end A of the bar, from the support C. *14*

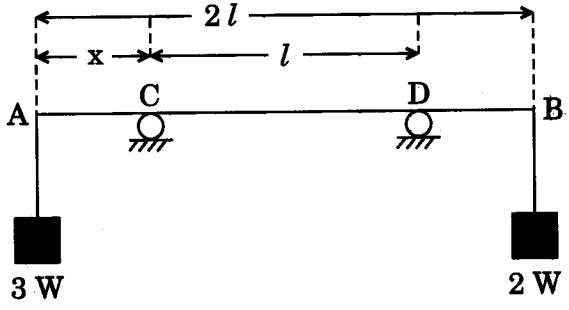

Figure 2

3. Determine the axial forces in the bars of a plane truss located as shown in Figure 3 below. *14*

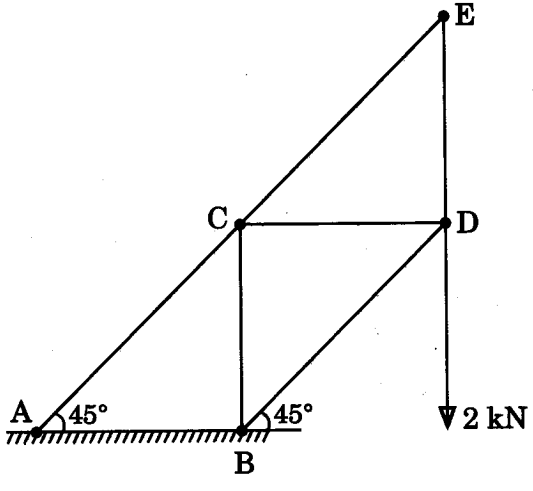

Figure 3

4. Find the moment of inertia of a plate with a circular hole about its centroidal x-axis. *14*

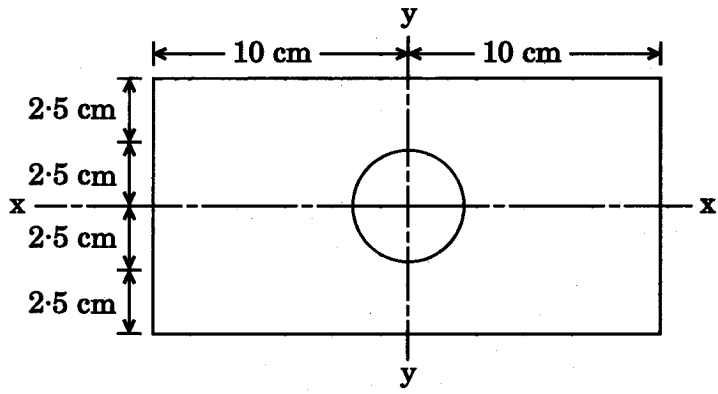

Figure 4

5. Two wedges lift a heavy block of 8 kN as shown in Figure 5. If the angle of wedges is 10° and the coefficient of friction is 0·3 for all surfaces of contact, find the value of P required to drive the wedges under the load. *14*

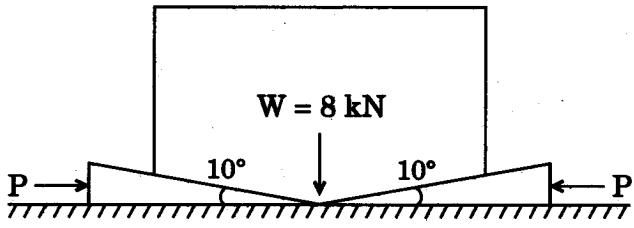

Figure 5

6. A boy throws a ball so that it may just clear a wall 4 m high. The boy is at a distance of 4·8 m from the wall. The ball was found to hit the ground at a distance of 4 m on the other side of the wall. Find the least velocity with which the ball can be thrown. *14*

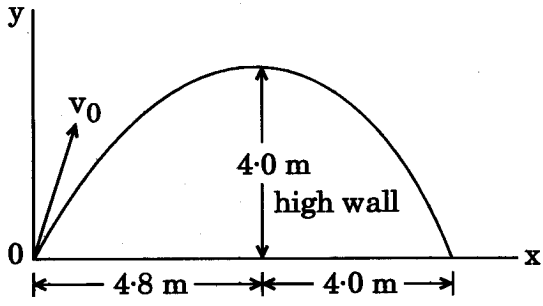

Figure 6

7. Calculate the pull in the cable during upward movement and pressure transmitted by a person of mass 65 kg to the floor during stopping, when the elevator mass is 600 kg and it starts from the position of rest and moves upwards at a constant acceleration. It gains a velocity of 2·5 m/sec in a travel distance of 4 m. While stopping in a uniform retardation it stops in 2 seconds from a velocity of 2·5 m/sec.
Assume g = 10 m/sec^2. *14*