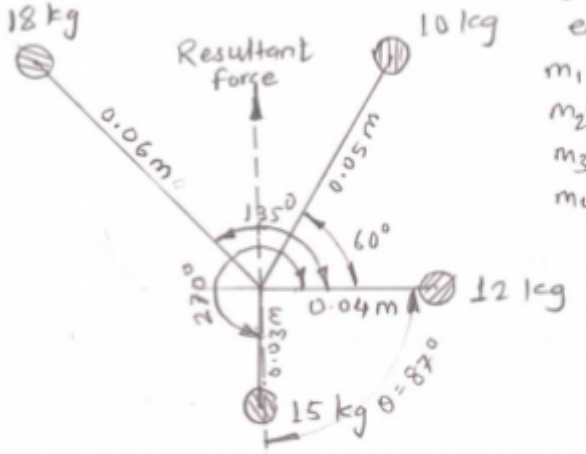
Published on *Mechanical Engg Simple Notes ,Solved problems and Videos* (https://mechdiploma.com)

Four masses A, B, C and D are attached to a shaft and revolve in the same plane.....

Question:
Four masses A, B, C and D are attached to a shaft and revolve in the same plane. The masses are 12 kg, 10 kg, 18 kg and 15 kg respectively and their radii of rotations are 40 mm, 50 mm, 60 mm and 30 mm. The angular position of the masses B, C and D are 60O, 135O ,and 270O from the mass 'A'. Find the magnitude and position of the balancing mass at a radius of 100 mm. Use graphical method only.

Answer:



a) Space Diagram.

Centrifugal force of each mass

$m_1 r_1 = 12 \times 0.04 = 0.48$ kg-m

$m_2 r_2 = 10 \times 0.05 = 0.50$ kg-m

$m_3 r_3 = 18 \times 0.06 = 1.08$ kg-m

$m_4 r_4 = 15 \times 0.03 = 0.45$ kg-m

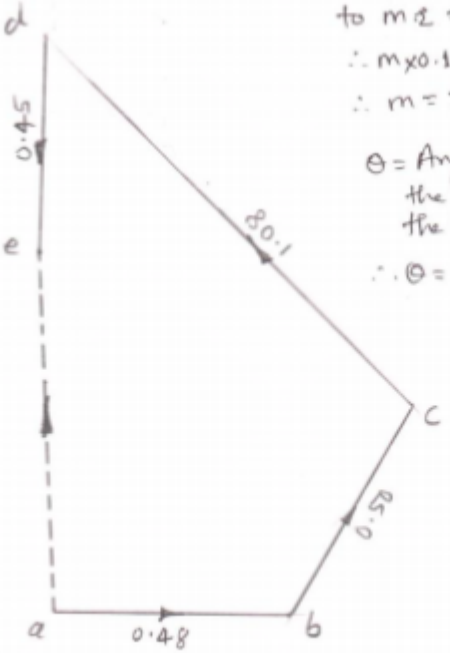
Balancing force is proportional to mr = vector ae

$\therefore m \times 0.1 = 0.75$ kg-m

$\therefore m = 7.5$ kg ..... Ans.

θ = Angle of inclination of the balancing mass from the horizontal mass 12 kg

$\therefore \theta = 87°$ (clockwise) ... Ans.



b) Vector Diagram.