

Important Questions (Applied Mechanics)

CIVIL-3th Sem

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Short Questions

1. Define mechanics and applied mechanics.
2. Explain elastic, plastic and ductile material.
3. Define: a.) kinetics and kinematics b.) mass and weight c.) scalar and vector quantities.
4. Differentiate between a.) Scalar and vector quantities. b) Action and reaction.
5. Write down the assumption are made in lami' s theory.
6. State the assumption and prove parallelogram law of forces.
7. What do you understand by forces and describe the characteristics of a forces.
8. Define Triangle law of forces.
9. Define shear force, bending moment and point of contra flexure at a beam.
10. Define moment and moment of a forces.
11. Distinguish between clockwise moments and anticlockwise moments.
12. Differentiate between the term torsion and torque.
13. Explain the levers and define various types of levers.
14. Explain various types of beams with sketches.
15. Define a.) coefficient of friction b.) angle of friction c.) angle of repose

Long Questions

1. A uniform rod 1m long is supported on two pegs so that the right side of the rod overhangs by 200mm. find out the reactions at the the pegs if the weight of rod is 4N/cm length of rod
2. Draw the shear force and bending moment diagram for the simply supported beam weighing 10 KN per metre length and 6m long carries the following loads. A point load of 30 KN at 2m from the left hand support and Auniformly distributed load of 20 KN/m over a length of 3m from right hand side.
3. A body of weight 300N is lying on a rough horizontal plane having a coefficient of friction as 0.3. Find the magnitude of the force which can move the body while acting at an angle of 25 with the horizontal?

4. A force of 50 N is just able to move a block of wood weighing 100N on a rough horizontal surface. Calculate the coefficient of friction and angle of friction
5. Find the centroid of an I-section having top flange 10x2cm and web 10x2cm, bottom flange 20x2cm
6. A steel bar is consisting of three length as shown in figure 1.3. Find the stresses in three parts and total elongation of bar for an axial load of 40KN. Take $E=2.1 \times 10^5 \text{ N/mm}^2$.
7. Find the centre of gravity of a channel section 200x100x10mm
8. An effort of 200N is applied to a lifting to raise a load of 1680N. If the velocity ratio of the machine is 10. Find the mechanical advantage efficiency and the efforts lost in friction?
9. Find the components of a force of 500N into two directions inclined at an angle of 45 and 30 with the forces?
10. A body has mass of 5kg. Calculate its weight.
11. The acceleration due to gravity on the moon is $\frac{1}{6}$ of the earth if a weight 16.35N on the moon. Find its mass?
12. Calculate the components of a force of 300N which is directed down to the right at a slope of 2 to 3 in the second quadrant.
13. Find the largest and smallest resultant of two forces whose magnitudes are 100N and 50N respectively.
14. A horizontal beam 12m long is supported at the ends and carries two loads one of 250N, 3m from the left and another of 600N, 7.50m from the left end calculate the reactions or upwards forces of support?