

Tilak Maharashtra Vidyapeeth

Diploma in Engineering

SUB: Applied Mechanics

Assignment No: I

(Write any five)

- 1) State and prove parallelogram law of forces with examples
- 2) A train changes its speed uniformly from 100 to 50 km/hr in a distance of 500m. What is its deceleration?
- 3) A bar of 200 mm length and 20mm diameter is stretched by 0.7mm by an axial pull of 22KN. Calculate the stress, strain and modulus of elasticity of the bar.
- 4) The velocity of a certain weight lifting machine is 20m/s. Determine the effort required to lift a load of 100N if the efficiency of the machine is 25%.
- 5) 1500 liters of water was lifted to a height of 6 m & delivered at a velocity of 4m/s. What is the energy possessed by the water?
- 6) A body of mass 20kg falls freely under gravity. Find its impulsive force after 19.2sec. and momentum also.
- 7) A body starts from rest with a constant acceleration of 0.5 m/s². After what time will its velocity be 2.5m/sec and how much distance will it travel during that time?
- 8) A copper wire of length 500mm is subjected to an axial pull of 5.5 KN. Find the extension if $E=100 \text{ N/mm}^2$.

Assignment No: II

(Write any five)

- 1) State and explain the law of transmissibility of forces.
- 2) Explain different systems of forces.
- 3) Explain Varignon's principle.
- 4) Explain different types of loads on a beam & frame.
- 5) Explain different structural supports.
- 6) Explain the centroid of a fundamental lamina.
- 7) Explain Newton's law of forces.
- 8) State and explain the Law of conservation of momentum.

Assignment No: III

(Write any five)

- 1) Find the position of centroid of an unequal angle section 100mm x 60mm x 10mm.
- 2) A body weighing 1500N is resting on a rough horizontal plane a pull of 300N applied at 30° up with respect to horizontal just moves the body. Find the coefficient of friction
- 3) A body of weight 400N is resting on a horizontal plane. Find the coefficient of friction. If a force of 120N is required to move the body.
- 4) Find the momentum of the train moving at 80 km/hr. if its weight is 4000KN.
- 5) A body of mass 10 kg falls freely under gravity. Find its momentum after 4 seconds.
- 6) A boat weighs 5000N including its occupant. The wind force of 400N acts on the boat. The resistance to motion of water is 150N. Find the acceleration of the boat
- 7) A ball of mass 2 kg moving at 10m/s. strikes another stationary ball of mass 5kg. If the first ball rebounds with a velocity of 4 m/s... find the velocity of the other ball.
- 8) Find the velocity of the car after 5 sec and the distance travelled in 5sec, if its initial velocity is 10m/s and uniform acceleration is 0.5m/sec^2