



Unit-I

1. Illustrate
 - a) coplanar concurrent forces.
 - b) coplanar parallel forces
 - c) collinear forces.
2. State parallelogram law of forces and give mathematical expression.
3. Define the equilibrium and equilibrant.
4. State Lami's theorem.
5. Three parallel forces F_1 , F_2 , F_3 are acting on a body as shown below. The body is in equilibrium. If $F_1 = 250$ N and $F_3 = 1000$ N and the distance between F_1 and F_2 is 1.0 m. Determine the magnitude of force F_2 and the distance of F_2 from force F_3 .
6. What are the conditions of equilibrium of a coplanar force system?
7. What is the moment of a force and mention types of moments?
8. Define the term "couple" and "moment of a couple".
9. State Newton's laws of motion?
10. State and prove Varignon's theorem?

Unit-2

1. Define the term force and mention the effect of force?
2. Differentiate between static and dynamic friction.
3. Define friction? How do you express the term friction?
4. State the laws of dry friction?
5. What is limiting friction?
6. Define coefficient of friction?
7. Define angle of friction?
8. Define cone of friction?

9. What is angle of repose?
10. What are the types of friction?

Unit -3

1. State Pappu's theorem I and II.
2. State and prove perpendicular axis theorem.
3. Mass moment of inertia of a sphere of mass 'm' and radius '2r' about any Diameter is
4. 4.what is the difference between centroid and center of gravity?
6. Write the coordinates of the centroid of a plane figure x_c y_c ?
7. Write the expression to find the center of gravity of a composite solid?
8. What is radius of gyration?
9. State and prove parallel axis theorem.
10. What is moment of inertia?
11. Write expression for mass moment of inertia?

Unit -4

1. Define rectilinear translation and curvilinear translation.
2. What is meant by dynamic equilibrium?
3. State D'Alembert's principle.
4. Define instantaneous center.
5. Define angle of projection/
6. Define horizontal Range.
7. Write the equation for trajectory of a projectile.
8. List equations of motions.
9. Define displacement.
10. Explain types of motion.

Unit-5

1. A block of weight 30 N is placed on a smooth inclined plane which makes 45° with horizontal. Calculate the work done when the block is pulled up by 5 m.
2. Determine the length of simple pendulum whose period is 2.5 sec.
3. Define forced vibration.
4. Define free vibration.
5. Explain law of conservation of momentum.
6. Define work.
7. Define power.
8. Write work energy equation.
9. Give applications of centrifugal and centripetal force.
10. Define impulse momentum.