

Exam Outline

Multiple Choice – 20

Short Answer – Do 3 out of 4

Problems

Part 1 – Do all 4 – Forces, Momentum, Centripetal, Projectile

Part 2 – Do 2 out of 3 – Forces

Part 3 – Do 2 out of 3 – Projectiles, Momentum, Centripetal

Key Concepts

Projectiles

- Find time

Momentum

- Remember to use x and y components

Centripetal

Forces

1. Forces at Angles

- Draw FBD and Break forces at angles into x and y components
- Normal force is Force of Gravity + F_y if pushing downward
- Normal force is $F_g - F_y$ if pulling upward

2. Atwood Machines

- Draw FBD flat and do F_{net}
- Modified Machines won't move if μF_g on flat $> F_g$ (hanging mass)

3. Inclined Planes

- Draw FBD
- $F_{||}$ always points down the ramp
- $F_N = F$ Perpendicular
- $F_{||} = mg\sin\theta$

4. Forces in Static Equilibrium – Hanging Signs

- Draw FBD and break forces at angles into x and y components
- $F_{net} = 0$ (not moving)
- If using substitutions ($F_y = F_x \tan\theta$) state them

5. Torque – Static Forces in Rotation

- Draw FBD
- Find r perpendiculars.