Physics I
Exam 2 Review

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Outline

1. Must knows!!
2. Multiple Choice
   - Chapter 5: FORCE AND MOTION I
   - Chapter 6: FORCE AND MOTION II
3. Problems
   - Problem 1
   - Problem 2

Must Knows!!

Constants:

$g = 9.81 \frac{m}{s^2}$ Volumes:

$V_{Sphere} = \frac{4}{3}\pi r^3$

$V_{Cylinder} = \pi r^2 h$ Surface Area:

$A_{Sphere} = 4\pi r^2$

Multiple Choice

Chapter 5: FORCE AND MOTION I

Question 1

An object moving at constant velocity in an inertial frame must:

A have a net force on it

B eventually stop due to gravity

C not have any force of gravity on it

D have zero net force on it

E have no frictional force on it

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Answer: D

Question 2

Acceleration is always in the direction:

A of the displacement

B of the initial velocity

C of the final velocity

D of the net force

E opposite to the frictional force

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Question 3

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A speed up

B slow down

C resist any change in its motion

D fall toward earth

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Answer: C

Question 4

Equal forces F act on isolated bodies A and B. The mass of B is three times that of A. The magnitude of the acceleration of A is:

A three times that of B

B 1/3 that of B

C the same as B

D nine times that of B

E 1/9 that of B

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Answer: A

Chapter 6: FORCE AND MOTION II

Question 1

A brick slides on a horizontal surface. Which of the following will increase the magnitude of the frictional force on it?

A putting a second brick on top

B decreasing the surface area of contact

C increasing the surface area of contact

D decreasing the mass of the brick

E none of the above

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Answer: A

Question 2

Why do raindrops fall with constant speed during the later stages of their decent?

A The gravitational force is the same for all drops

B Air resistance just balances the force of gravity

C The drops all fall from the same height

D The force of gravity is negligible for objects as small as raindrops

E Gravity cannot increase the speed of a falling object to more than 9.8 m/s

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Answer: B

Question 3

A ball is thrown upward into the air with a speed that is greater than terminal speed. On the way up it slows down and, after its speed equals the terminal speed but before it gets to the top of the trajectory:

A its speed is constant

B it speeds up

C it continues to slow down

D its motion becomes jerky

E none of the above

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Answer:C

Question 4

An object moves around a circle. If the radius is doubled keeping the speed the same then the magnitude of the centripetal force must be:

A twice as great

B half as great

C four times as great

D one-fourth as great

E the same

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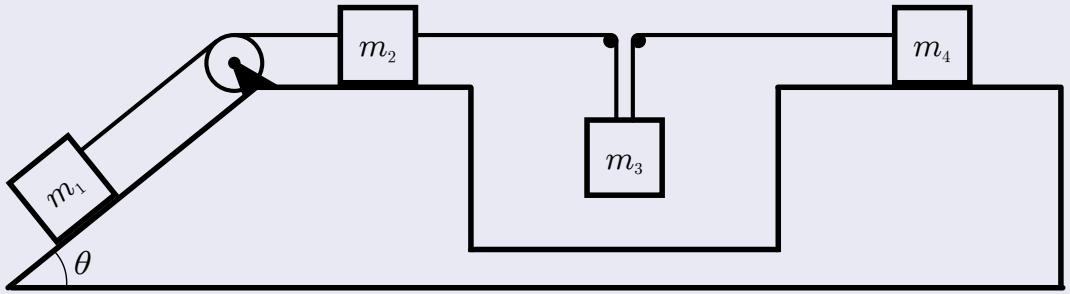
Answer: B

Problems

Problem 1

In the following system m_1 accelerates downward in the *negative* direction. Consider all pulleys to be massless and frictionless and consider both cords to be massless.

m_1=6kg θ=$\pi/8$
m_2=1kg
m_3=3kg
m_4=5kg



A Draw and label all forces acting on each block.

B Find a simplified mathematical model describing the magnitude of the acceleration of the system.

C Find the magnitude of the tension in each cord for the values given.

D Find how long it takes m_3 to reach the bottom the pit, given the depth, d, of the pit is 3m, and the system starts from rest.

E Find a value for, θ, to keep the system from accelerating when released.

Problem 2