Chapters/ Sections will be Covered

Book: Fundamentals of Physics by David Halliday, Jearl Walker, and Robert Resnick

Chapter Title: Motion along a straight line

Sections:

- Instantaneous Velocity & Speed
- Acceleration
- Constant Acceleration
- Free-Fall Acceleration

Sample Quiz Question

A driver wanted to stop the car 15 minutes after driving started and the car stopped within the last 15 minutes. What is true for the displacement of the car in the last 15 minutes?

a) A positive displacement will occur.
b) A negative displacement will occur.
c) The displacement for the first and last 15 are the same.
d) There is not enough data.

A student wants to solve the acceleration of a vehicle and finds that $x_f < x_i$. What is the name of the acceleration?

a) Acceleration along the motion
b) Deceleration
c) Remains the same acceleration
d) Does not have enough data

Sample Quiz Question

In the case of constant acceleration, which of the following statements is true?
a) The acceleration increases over time.
b) The acceleration decreases over time.
c) The velocity increases over time.
d) The position decreases over time.

A car was running on a mountaintop surface, crashed on a boulder, and fell downward toward the ground. What is the acceleration of the car?
a) Positive acceleration
b) Negative acceleration
c) Positive free fall acceleration
d) Constant positive acceleration

Sample Quiz Question

Which statement is not true for free-fall acceleration and constant acceleration?
a) They are all constant acceleration.
b) The difference is free-fall acceleration due to gravity.
c) The object's final velocity is higher than the initial velocity due to free-fall.
d) Free-fall is not a constant acceleration.

If an object’s velocity changes at the same amount over time, what is the term used to describe the phenomena?
a) Constant velocity
b) Constant displacement
c) Constant acceleration
d) Free-fall acceleration

Sample Quiz Question

It was observed that a basketball falls at the same consistently increasing velocity rate as a tennis ball in space. What is happening?

a) Positive constant acceleration.
b) Constant velocity due to gravity.
c) Free all acceleration.
d) Discontinuous acceleration.

In a velocity vs time graph, it was observed that a constant velocity was found. What is the acceleration value in the acceleration vs time graph?

a) Constant velocity
b) Maximum acceleration
c) Minimum acceleration
d) 0

Class Activity: Math Problem #1

A delivery boy delivered Andrew's parcel to his home. The delivery boy went there at a constant speed of 35 km/h and returned to the delivery unit at a constant speed of 40 km/h. What is the average speed of this round trip?

Class Activity: Math Problem #2

A particle tracker develops a trajectory of the particle's movement. The trajectory equation is: $v(m/s) = t^3 - 2t + 3$. Find the position (x) of the particle at 1) $1s$ and 2) $3s$.

Class Activity: Math Problem #3

A train is moving through a rural area and forwarding at a constant acceleration of $4.1\ m/s^2$. In an instant, a traveler inside the train measures the velocity as $20.7\ m/s$. Calculate the velocity of the train (a) $4s$ earlier and (b) $4s$ later of that instant.

Probable Mid-term Questions – 1-2 Points Question: Lecture 1 & Lecture 2

Describe briefly how distance differs from the displacement of a moving object.

Briefly describe the difference between the average and instantaneous velocity of an object.

Briefly mention some characteristics of free-fall acceleration.

Mathematical problems & practice problems in the lectures.