Ch 3,4 Review

3.1 Conceptual Questions

____ 1) If the velocity of an object is zero at some point, then its acceleration must also be zero at that point.
A) True B) False

____ 2) Which of the following situations is *impossible*?
A) An object has velocity directed east and acceleration directed west. B) An object has velocity directed east and acceleration directed east. C) An object has zero velocity but non-zero acceleration. D) An object has constant non-zero acceleration and changing velocity. E) An object has constant non-zero velocity and changing acceleration.

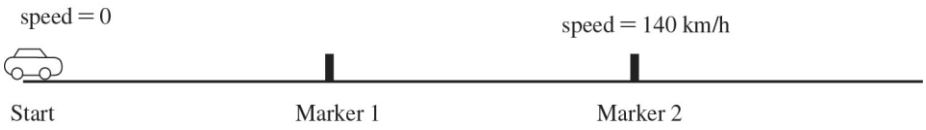
____ 3) If the acceleration of an object is zero, then that object cannot be moving.
A) True B) False

____ 4) If the velocity of an object is zero, then that object cannot be accelerating.
A) True B) False

____ 5) Suppose that an object is moving with a constant velocity. Which statement concerning its acceleration must be correct?
A) The acceleration is constantly increasing. B) The acceleration is constantly decreasing.
C) The acceleration is a constant non-zero value. D) The acceleration is equal to zero.

____ 6) Suppose that a car traveling to the east (+*x* direction) begins to slow down as it approaches a traffic light. Which statement concerning its acceleration must be correct?
A) Its acceleration is in the +*x* direction. B) Its acceleration is in the -*x* direction. C) Its acceleration is zero. D) Its acceleration is decreasing in magnitude as the car slows down.

____ 7) A racing car accelerates uniformly from rest along a straight track. This track has markers spaced at equal distances along it from the start, as shown in the figure. The car reaches a speed of 140 km/h as it passes marker 2.



Where on the track was the car when it was traveling at half this speed, that is at 70 km/h?
A) Before marker 1 B) At marker 1 C) Between marker 1 and marker 2

____ 8) When a ball is thrown straight up with no air resistance, the acceleration at its highest point
A) is upward B) is downward C) is zero D) reverses from upward to downward E) reverses from downward to upward

4.1 Conceptual Questions

____ 9) Two displacement vectors have magnitudes of 5.0 m and 7.0 m, respectively. If these two vectors are added together, the magnitude of the sum
A) is equal to 2.0 m. B) could be as small as 2.0 m or as large as 12 m. C) is equal to 12 m.
D) is equal to 8.6 m.

____ 10) The magnitude of the resultant of two vectors cannot be less than the magnitude of either of those two vectors.
A) True B) False

____ 11) If three vectors add to zero, they must all have equal magnitudes.
A) True B) False

____ 12) The magnitude of a vector an only zero if *all* of its components are zero.

____ 13) For general projectile motion with no air resistance, the horizontal component of a projectile's velocity
A) remains zero. B) remains a non-zero constant. C) continuously increases. D) continuously decreases. E) first decreases and then increases.

____ 14) The sum of two vectors of fixed magnitudes has the greatest magnitude when the angle between these two vectors is
A) 90° B) 180° C) 60° D) 0° E) 270°

____ 15) If a vector's components are all negative, then the magnitude of the vector is negative.

____ 16) For general projectile motion with no air resistance, the horizontal component of a projectile's acceleration
A) is always zero. B) remains a non-zero constant. C) continuously increases. D) continuously decreases. E) first decreases and then increases.

____ 17) For general projectile motion with no air resistance, the vertical component of a projectile's acceleration
A) is always zero. B) remains a non-zero constant. C) continuously increases. D) continuously decreases. E) first decreases and then increases.

____ 18) A ball is thrown horizontally from the top of a tower at the same instant that a stone is dropped vertically. Which object is traveling faster when it hits the level ground below if neither of them experiences any air resistance?
A) It is impossible to tell because we do not know their masses. B) the stone C) the ball
D) Both are traveling at the same speed.

4.2 Problems

____ 19) A boy jumps with a velocity of magnitude 20.0 m/s at an angle of 25.0° above the horizontal. What is the horizontal component of the boy's velocity?
A) 18.1 m/s B) 15.6 m/s C) 8.45 m/s D) 12.6 m/s E) 9.33 m/s

____ 20) You walk $33\,\text{m}$ to the north, then turn 60° to your right and walk another $45\,\text{m}$. How far are you from where you originally started?
A) 68 m B) 39 m C) 75 m D) 35 m

____ 21) Vector $\vec{\mathbf{M}}$ = 4.00 m points eastward and vector $\vec{\mathbf{N}}$ = 3.00 m points southward. The resultant vector $\vec{\mathbf{M}} + \vec{\mathbf{N}}$ is given by
A) 5.00 m at an angle of 36.9° south of east. B) 5.00 m at an angle of 53.1° south of east. C) 5.00 m at an angle of 71.6° south of east. D) 5.00 m at an angle of 18.4° south of east. E) 5.00 m at an angle of 26.6° south of east.

____ 22) A girl throws a rock horizontally, with a velocity of 10 m/s, from a bridge. It falls 20 m to the water below. How far does the rock travel horizontally before striking the water, assuming negligible air resistance?
A) 14 m B) 16 m C) 20 m D) 24 m

____ 23) A person throws a ball horizontally from the top of a building that is 24.0 m above the ground level. The ball lands 100 m down range from the base of the building. What was the initial velocity of the ball? Neglect air resistance and use $g = 9.81\ \text{m/s}^2$.
A) 202 m/s B) 9.80 m/s C) 19.6 m/s D) 45.2 m/s E) 94.4°

Ch 3,4 Review
Answer Section

1)	ANS: B	PTS: 1	REF: Var: 1
2)	ANS: E	PTS: 1	REF: Var: 1
3)	ANS: B	PTS: 1	REF: Var: 1
4)	ANS: B	PTS: 1	REF: Var: 1
5)	ANS: D	PTS: 1	REF: Var: 1
6)	ANS: B	PTS: 1	REF: Var: 1
7)	ANS: A	PTS: 1	REF: Var: 1
8)	ANS: B	PTS: 1	REF: Var: 1
9)	ANS: B	PTS: 1	REF: Var: 1
10)	ANS: B	PTS: 1	REF: Var: 1
11)	ANS: B	PTS: 1	REF: Var: 1
12)	ANS: T	PTS: 1	REF: Var: 1
13)	ANS: B	PTS: 1	REF: Var: 1
14)	ANS: D	PTS: 1	REF: Var: 1
15)	ANS: F	PTS: 1	REF: Var: 1
16)	ANS: A	PTS: 1	REF: Var: 1
17)	ANS: B	PTS: 1	REF: Var: 1
18)	ANS: C	PTS: 1	REF: Var: 1
19)	ANS: A	PTS: 1	REF: Var: 1
20)	ANS: A	PTS: 1	REF: Var: 31
21)	ANS: A	PTS: 1	REF: Var: 1
22)	ANS: C	PTS: 1	REF: Var: 1
23)	ANS: D	PTS: 1	REF: Var: 6