

## Physics 10 1<sup>st</sup> Test (100 PTS MAX) - #A

### 1:00PM, Fall 2003

1. When Newton's second law is used to express weight, the acceleration is then (a) due to gravity (b) zero (c) directly proportional to the mass (d) none of the preceding.
2. When a car moves at constant speed on a straight road (a) The net force is downward (b) There is a constant net force acting on it (c) There is no net force acting on it (d) There are no forces acting on it.
3. For two objects of different mass in free fall (a) The accelerations are different (b) The more massive object will reach the ground first if released simultaneously (c) Air resistance is a consideration (d) The acting forces are different.
4. Which of the followings are the fundamental properties used to describe motion (a) Length and weight (b) Length and time (c) Speed and time (d) Weight and speed.
5. An automobile is traveling due east on an interstate highway at a constant velocity of 65 miles per hour. The **unbalanced** force acting on the car with respect to the highway is (a) Toward the east (b) Toward the west (c) Directed vertically (d) Zero.
6. Work is done on an object when it is (a) acted upon by a balanced force (b) stationary (c) moved (d) none of the preceding.
7. The combustion of gasoline involves the release of (a) electrical energy (b) chemical energy (c) radiant energy (d) Electromagnetic energy.
8. Mechanical energy is (a) the same as total energy in all cases (b) always conserved (c) the sum of kinetic and potential energies (d) none of the preceding.
9. The gravitational potential energy (a) is independent of height (b) is independent of path (c) is always positive (d) decreases with increasing height.
10. The time rate of doing work is (a) power (b) energy (c) momentum (d) efficiency.
11. A change in momentum may result from (a) an acceleration (b) a force (c) an impulse (d) all of the preceding.
12. In order to reduce the "string" in catching a hard ball, one usually (a) increases the change in momentum (b) increases the contact time. (c) increases the impulse (d) increases the contact force.
13. Padded dashboards in automobiles reduce injury by (a) decreasing friction (b) increasing the contact time (c) increasing friction (d) stopping the passenger more quickly.
14. Momentum takes into account (a) shape and size (b) collisions and heat (c) inertia and motion (d) space and time.
15. When objects stick together after collision (a) the momentum is not conserved (b) the momentum is zero (c) the collision is completely inelastic (d) the collision is elastic.
16. For a projection at an angle, the common factor for the x- and y-components of motion is (a) speed (b) acceleration (c) direction (d) time.
17. Centrifugal force is (a) the reaction force to centripetal force (b) a requirement for circular motion (c) the same as centripetal force (d) a pseudo force.
18. The braking action of a large jet plane after landing is chiefly due to (a) mechanical brakes (b) tire friction (c) resistance on wing foils (d) reverse thrust.
19. A projectile (a) has a constant speed in the horizontal direction (b) is always projected in one dimension (c) has no forces acting on it (d) has no vertical acceleration.

20. If air resistance is a factor in a horizontal projection or a projection at an angle, the range of the projectile would be (a) greater (b) less (c) the same (d) none of them.
21. Ocean tides occur (a) once daily (b) exactly 24 hours apart (c) because of lunar gravitation (d) only in the Southern Hemisphere.
22. The acceleration due to gravity,  $g$ , (a) is a universal constant (b) increases with altitude (c) does not depend on the mass of the Earth (d) does not depend on the mass of an object.
23. A location in a gravitational field is (a) on a line of force (b) the acceleration due to gravity at that point (c) the gravitational force per unit mass at that point (d) all of the preceding.
24. The theory of gravity as being a warping of space-time was proposed by (a) Einstein (b) Halley (c) Newton (d) Lowell.
25. The weakest fundamental force is the (a) electromagnetic force (b) gravitational force (c) weak nuclear force (d) strong nuclear force.
26. If every particle of a body has the same instantaneous velocity, it is (a) in rolling motion (b) in rotational motion (c) in translational motion (d) at rest.
27. The farther the mass of a body is from the axis of rotation, (a) the smaller its rotational speed (b) the larger the number of radians in a circle (c) the larger the moment of inertia (d) none of the preceding.
28. The angular momentum of a system is conserved when (a) there is an angular acceleration (b) the torques are balanced (c) there is an unbalanced torque (d) none of the preceding.
29. As a planet or a comet approaches the Sun its speed increases so as to maintain constant (a) kinetic energy (b) velocity (c) linear momentum (d) angular momentum about the sun.
30. A circus stilt walker stand balanced on one stilt. He is in (a) stable equilibrium (b) unstable equilibrium (c) neutral equilibrium (d) universal equilibrium.
31. What is the average speed of a cheetah that sprints 100m in 4 seconds? (a) 100m/sec (b) 50m/sec (c) 25 m/sec (d) 25m
32. If a car moves with an average speed of 60km/hr for an hour, it will travel a distance of 60km. How far will it travel if it moved at this rate for 4hrs? (a) 60km (b) 60km/hr (c) 240 km/hr (d) 240 km
33. A particular car can go from rest to 90km/hr in 10 sec. What is its acceleration? (a) 9km/hr hr (b) 205m/hr hr (c) 9km/sec sec (d) 2.5m/sec sec
34. What is the acceleration of a 40-kg. block of cement when pulled side ways with a net force of 200 N? (a)  $1 \text{ m/s}^2$  (b)  $2 \text{ m/s}^2$  (c)  $4 \text{ m/s}^2$  (d)  $5 \text{ m/s}^2$
35. How much acceleration does a 747 Jumbo Jet of a mass of 30,000 kg experience in take off when the thrust for each of the four engines is 30,000 N? (a)  $1 \text{ m/s}^2$  (b)  $2 \text{ m/s}^2$  (c)  $4 \text{ m/s}^2$  (d)  $4 \text{ m/s}^2$
36. What is the impulse needed to stop a 10-kg bowling ball moving at 6m/s? (a) 10 kg m/sec (b) 20 kg m/sec (c) 60 kg m/sec (d) 30 kg m/sec
37. A car with a mass of 100kg moves at 20m/sec. What braking force is needed to bring the car to a halt in 10sec? (a) -2000 N (b) 1000 kg (c) 2000 kg (d) 2000 N
38. How much work is done on it when you lift a 75N bowling ball 1m? (a) 75 N (b) 75 Joules (c) 75 watts (d) 75 m
39. What is the tangential speed of a passenger on a Ferris wheel that has a radius of 10 m and rotates once in 10 seconds? (a) 3.1416 m (b) 6.283 m (c) 6.283 m/sec (d) 3.1416 m/sec
40. The value of  $g$  at the Earth's surface is about  $9.8 \text{ m/s}^2$ . What is the value of  $g$  at a distance from the Earth's center that is four times the Earth's radius? (a)  $0.625 \text{ m/s}^2$  (b)  $0.625 \text{ m/s}$  (c)  $9.8 \text{ m/s}^2$  (d)  $9.8 \text{ m/s}$