

Physics 10 1st Test (100 PTS MAX) - #B
5:35PM, Fall 2003

1. During a full-moon spring tide, the gravitational attractions of the Sun and moon on the Earth
(a) cancel each other (b) produce higher low tides (c) are generally in opposite directions
(d) produce very high tides because the moon is closer to the Sun.
2. Which planet's discovery was a direct result of using Newton's law of gravitation? (a) Neptune
(b) Uranus (c) Planet X (d) Saturn.
3. Compared with its value on the Earth's surface, the acceleration due to gravity at an altitude of one Earth radius is (a) the same (b) two times greater (c) one-half as great (d) one-fourth as great.
4. A location in a gravitational field is (a) the gravitational force per unit mass at that point (b) the acceleration due to gravity at that point (c) on a line of force (d) all of the preceding.
5. The weakest fundamental force is the (a) electromagnetic force (b) gravitational force (c) weak nuclear force (d) strong nuclear force.
6. A particle (a) has no physical dimensions (b) can be accurately located (c) does not have rotation (d) all of the preceding apply.
7. The moment of inertia is a measure of (a) rotational speed (b) rotational inertia (c) angular acceleration (d) torque.
8. An object in stable equilibrium will remain so as long as its center of gravity is (a) outside the object (b) inside and above its original base of support (c) at the same location as its center of mass (d) none of the preceding.
9. A spiraling football is an example of (a) pure translational motion (b) pure rotational motion (c) a nonrigid body (d) the general motion of a rigid body.
10. A circus stilt walker stand balanced on one stilt. He is in (a) unstable equilibrium (b) stable equilibrium (c) neutral equilibrium (d) universal equilibrium.
11. What is the average speed of a cheetah that sprints 100 meters in 4 seconds? (a) 100m (b) 100m/s (c) 25m/s (d) 4m
12. A particular car can go from rest to 90km/hr in 10 seconds. What is its acceleration? (a) 9m/s^2 (b) 9m/s (c) 2.5m/s^2 (d) 2.5m/s
13. What is the acceleration of a 40 kg block of cement when pulled sideways with a net force of 200N? (a) 40 kg (b) 40 m/sec^2 (c) 5 m/sec^2 (d) 5 m/sec
14. A firefighter of a mass 80 kg slides down a vertical pole with an acceleration of 4 m/sec^2 . What is the friction force that acts on the firefighter? (a) 80 N (b) 320 N (c) 460 N (d) 784 N
15. A cyclist leaves Las Vegas riding at the rate of 18 mph. One hour later a car leaves Las Vegas going 45 mph in the same direction. How long will it take the car to over take the cyclist? (a) 1hr (b) 2 hr (c) 0.667 hr (d) 1.5 hr
16. What is the impulse needed to stop a 10 kg bowling ball moving at 6 m/sec? (a) 10 N (b) 6 kg (c) 10 kg m/sec (d) 60 kg m/sec
17. A car with a mass of 1000 kg moves at 20 m/sec. What braking force is needed to bring the car to a halt in 10 seconds? (a) 1000 N (b) 2000 N (c) 500 N (d) 1500 N
18. A car moving at 50 km/h skid 15 m with locked brakes. How far will the car skid with locked brakes at 100 km/h? (a) 135 m (b) 50 m (c) 60 m (d) 100 m
19. 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

20. A ball is thrown horizontally from a cliff at a speed of 10 m/s. What is its speed 1 second later?
(a) 10 m/sec (b) 20 m/sec (c) 14 m/sec (d) 14 m
21. For a car to accelerate, it must (a) have a change in velocity (b) have a constant speed (c) start from rest (d) none of the preceding.
22. When Newton's second law is used to express weight, the acceleration is then (a) zero (b) due to gravity (c) directly proportional to the mass (d) none of the preceding.
23. Suppose your physics book is lying on a table. How many forces are acting on it? (Neglect air pressure and extraterrestrial forces) (a) One (b) Two (c) Five (d) Six.
24. The action and reaction forces of Newton's third law always (a) Act on different bodies (b) Are equal in magnitude (c) Are opposite directions (d) Are all of the above.
25. 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.
26. The unit of energy in the SI is the (a) watt (b) Newton (c) joule (d) horsepower.
27. Energy cannot be (a) transferred (b) created (c) conserved (d) both (a) and (c).
28. The gravitational potential energy (a) is independent of path (b) is independent of height (c) is always positive (d) decreases with increasing height.
29. The form of energy in which mass conversion is significant is (a) electrical (b) gravitational (c) nuclear (d) chemical.
30. A machine (a) is not subject to the conservation of energy (b) can run perpetually (c) multiplies the work input (d) can have a mechanical advantage greater than one.
31. With constant mass, the conservation of momentum is essentially stated in which of Newton's Law? (a) First (b) Second (c) Third (d) Gravitation
32. In order to reduce the "string" in catching a hard ball, one usually (a) increases the contact time (b) increases the contact force (c) increases the impulse (d) increases the change in momentum.
33. Automobile air bags protect passengers during collisions by (a) increasing both the impulse time and impulse force (b) increasing the impulse time and decreasing the impulse force (c) reducing the impulse (d) decreasing both the impulse time and force.
34. The impulse applied to an object is equal to the change in its (a) kinetic energy (b) acceleration (c) momentum (d) velocity.
35. For a system of constant mass, the conservation of momentum is essentially stated in (a) Newton's first law (b) Newton's second law (c) Newton's third law (d) Newton's law of gravitation.
36. Uniform circular motion requires (a) centripetal acceleration (b) centripetal force (c) tangential velocity (d) all of the preceding.
37. A cannon ball is projected at a 45-degree angle with an initial velocity v . Neglecting air resistance, at its maximum height it will have (a) no velocity (b) no vertical velocity (c) a maximum horizontal velocity (d) resistance on wing foils.
38. An object in uniform circular motion has constant (a) speed (b) velocity (c) tangential acceleration (d) momentum.
39. Kepler stated that the geometric shape of the orbits of the planets is a(n) (a) circle (b) parabola (c) ellipse (d) rectangle.
40. A vertically projected object (a) has zero acceleration at maximum height (b) has a constant velocity (c) has a greater acceleration than a horizontally projected object (d) returns to its starting point with the same initial speed.