Physics 10 1st Midterm (200 pts MAX.) – TEST B
Spring 2005

1. If a car moves with an average speed of 60 km/h, how far would it travel for 4 hours? (a) 60 km (b) 120 km (c) 240 km (d) 360 km
2. If a mass of 1 kg is accelerated 1 m/s^2 by a force of 1N, what would be the acceleration of 2 kg acted on by a force of 2N? (a) 2 m/sec^2 (b) 4 m/sec (c) 1 m/sec^2 (d) 1 m/sec
3. A golf ball (0.142 kg) left a player's hand at a speed of 20.0 m/sec. If the straight throw lasted 0.050 sec, determine the force exerted on the ball? (a) 20.0 N (b) 142 N (c) 56.8 N (d) 56.8 m/s^2
4. 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) 2 hr (b) 3 hr (c) 0.6666 hr (d) 1 hr
5. If force-in = 2N, force-out = 10N, then AMA is? (a) 10 (b) 5 (c) 1 (d) 20
6. If F = 100 newton, area = $4m^2$. What is the pressure? (a) 100 N/m^2 (b) 50 N/m^2 (c) 25 N/m^2 (d) N
7. What is the momentum of a bicycle and rider with a total mass of 80 kg and a speed of 10 m/sec? (a) 80 kg·m/sec (b) 800 kg·m/sec (c) 8 kg·m/sec (d) 8000 kg·m/sec
8. If the speed of an object in uniform circular motion is doubled, the centripetal force will be increased by a factor of what? (a) 1 (b) 2 (c) 4 (d) 8
9. Suppose your throw a ball straight up into the air with an initial speed of 25 m/sec. How much ht will it go? (a) 25 m (b) 63.75 m (c) 31.89 m (d) none
10. 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/sec (b) 6.283 m/sec (c) 3.1416 m (d) 6.283 m
11. The motor boat can go 18 mph in still water. If a trip down stream takes 4 hours and the return trip takes 5 hours, find the speed of the current? (a) 18 mph (b) 6 mph (c) 2 mph (d) 1 mph
12. A typical dragon can lift 300 lb of knight in armor 20 feet in 2 seconds. What is one dragon power? (a) 3000 ft·lb/sec (b) 300 ft·lb/sec (c) 6000 ft·lb/sec (d) 1000 ft·lb/sec
13. Consider an air track. Suppose a gliding cart with a mass of 0.5 kg bumps into and sticks to a stationary cart that has a mass of 1.5 kg. If the speed of the gliding cart before impact is V_{before}, how fast will the coupled carts glide after collision? (a) 1 m/sec (b) 2 m/sec (c) 4 m/sec (d) 8 m/sec
14. The inertia of a body may be expressed in terms of its (a) speed (b) acceleration (c) mass (d) all of the preceding
15. The action and reaction of Newton's third law (a) are in the same direction (b) have different magnitudes (c) act on different bodies (d) can be the same force
16. For two objects of different mass in free fall (a) The accelerations are different (b) The acting forces are different (c) Air resistance is a consideration (d) The more massive object will reach the ground first if released simultaneously
17. Kinetic friction is generally static friction. (a) Less than (b) More than (c) Better than (d) equal to
18. The unit of work in the SI is the (a) newton (b) ft-lb (c) joule (d) both (a) and (c)
19. The unit of energy in the SI is the (a) joule (b) newton (c) watt (d) horsepower
20. Energy cannot be (a) transferred (b) conserved (c) created (d) both (a) and (c)
21. The gravitational potential energy (a) is independent of height (b) is always positive (c) is independent of path (d) decreases with increasing height
22. A force (a) always produces motion (b) is a scalar quantity (c) is capable of producing a change in motion (d) both (a) and (c)
23. The air resistance on a falling object depends on its (a) shape (b) size (c) speed (d) all of the preceding
24. When a car moves at constant speed on a straight road (a) There are no forces acting on it (b) There is a constant net force acting on it (c) There is no net force acting on it (d) The net force is downward
25. If the new force acting on an object is doubled, the acceleration is (a) None (b) Double (c) Triple (d) Quadruple

26. 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
27. If motor A has twice as much horsepower as motor B, then motor A has the power capability to do (a) half the work in twice the time (b) the same work in half the time (c) Twice the work in half the time (d) none of the preceding
28. The random motion of molecules in a substance is associated with (a) electrical energy (b) heat energy (c) chemical energy (d) all of the preceding
29. Efficiency (a) has no units (b) is the same as mechanical advantage (c) may be greater than 1.0, or 100% (d) can be negative
30. A machine (a) can have a mechanical advantage greater than one (b) multiplies the work input (c) can run perpetually (d) is not subject to the conservation of energy
31. By manipulating the impulse, one can change the (a) force (b) contact time (c) momentum (d) all of the preceding
32. Which of the following are conserved in an inelastic collision? (a) Momentum (b) Kinetic energy (c) Impulse (d) both (a) and (b)
33. The impulse applied to an object is equal to the change in its (a) kinetic energy (b) acceleration (c) momentum (d) velocity
34. Momentum takes into account (a) space and time (b) collisions and heat (c) inertia and motion (d) shape and size
35. Two balls moving toward each other on a frictionless horizontal surface collided and immediately came to a complete stop. This shows that the balls (a) are perfectly elastic (b) have the same mass (c) had equal amounts of kinetic energy before impact (d) had equal amounts of momentum before impact
36. Centrifugal force is (a) the reaction force to centripetal force (b) a pseudo force (c) the same as centripetal force (d) a requirement for circular motion
37. The braking action of a large jet plane after landing is chiefly due to (a) tire friction (b) mechanical brakes (c) reverse thrust (d) resistance on wing foils
38. Kepler stated that the geometric shape of the orbits of the planets is a(n) (a) circle (b) parabola (c) ellipse (d) rectangle
39. The force of gravity (a) keeps the moon in orbit (b) causes us to have weight (c) produces ocean tides (d) all of the preceding
40. Which planet's discovery was a direct result of using Newton's law of gravitation? (a) Neptune (b) Uranus (c) Planet X (d) Saturn
41. A location in a gravitational field is (a) the gravitational force per unit mass at that point (b) on a line of force (c) the acceleration due to gravity at that point (d) all of the preceding
42. If a satellite near the Earth's surface does not have a minimum tangential speed of 8 km/s, it will (a) go into an elliptical orbit (b) go into a circular orbit (c) fall back to Earth (d) escape into outer space
43. A particle (a) has no physical dimensions (b) can be accurately located (c) does not have rotation (d) all of the preceding apply
44. How many radians are there in one complete rotation? (a) 2 ll (b) 3 ll (c) 4 ll (d) 360
45. The torque on a body can be increased by increasing the (a) lever arm (b) force (c) inertia (d) both (a) and (b)
46. The angular momentum of a system is conserved when (a) the torques are balanced (b) there is an unbalanced torque (c) there is an angular acceleration (d) none of the preceding
47. As a planet or a comet approaches the Sun it’s speed increases so as to maintain constant (a) kinetic energy (b) velocity (c) linear momentum (d) angular momentum about the Sun
48. The periodic table was formulated by (a) Democritus (b) Dalton (c) Einstein (d) Mendelvee
49. A liquid has (a) definite shape and volume (b) definite volume but no definite shape (c) no definite shape or volume (d) none of the preceding
50. An atom or molecule with a net electrical charge due to the transfer (loss or gain) of one or more electrons is known as a/an (a) isotope (b) polar atom or molecule (c) ion (d) none of these