Physics 10 Midterm (150 PTS MAX) - #B
5:35PM, Fall 2003

1. When a car moves at constant spend 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.
2. 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.
3. The combustion of gasoline involves the release of (a) electrical energy (b) chemical energy (c) radiant energy (d) Electromagnetic energy.
4. The time rate of doing work is (a) power (b) energy (c) momentum (d) efficiency.
5. Momentum takes into account (a) shape and size (b) collisions and heat (c) inertia and motion (d) space and time.
6. For a projection at an angel, the common factor for the x- and y-components of motion is (a) speed (b) acceleration (c) direction (d) time.
7. 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.
8. 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.
9. 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.
10. 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.
11. What is the average speed of a cheetah that sprint's 100m in 4 seconds? (a) 100m/sec (b) 50m/sec (c) 25 m/sec (d) 25m
12. 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
13. 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
14. What is the acceleration of a 40-kg. block of cement when pulled side ways with a net force of 200 N? (a) 1 m/s^2 (b) 2 m/s^2 (c) 4 m/s^2 (d) 5 m/s^2
15. 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 m/s^2 (b) 2 m/s^2 (c) 4 m/s (d) 4 m/s^2
16. 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
17. 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
18. 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
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. The value of *g* at the Earth's surface is about 9.8 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 m/s^2 (b) 0.625 m/s (c) 9.8 m/s^2 (d) 9.8 m/s

21. When a quantity of dilute gas in a rigid container is heated, it a) expands b) has a pressure reduction c) loses internal energy d) none of the preceding
22. When the volume of a gas is decreased a) the density must increase b) the pressure must increase c) the temperature must increase d) Boltzmann's constant changes
23. For a balloon to rise, the gas inside must have _____ than the air outside. a) fewer molecules per unit volume b) less density c) less humidity d) less internal energy

24. The period of an SHM oscillation a) increases with amplitude b) is equal to 1/f c) has units of hertz d) is always in phase
25. If the combined waveforms of two identical interfering waves is smaller than that of either wave, the interferences is said to be a) destructive b) constructive c) standing d) both (a) and (c)
26. The propagation of energy through a medium or space from a disturbance is a(n) a) oscillation b) vibration c) wave d) harmonic
27. Concert halls experience sound problems because of a) multiple reflections b) refraction c) reverberant sound d) both (a) and (c)
28. If a sound source and an observer both move with the same constant velocity, the frequency heard by the observer relative to the source frequency would be a) the same b) higher c) lower
29. For the Doppler effect to occur, there must be a) a moving source of sound b) a moving listener c) relative motion between a source of sound and listener d) all of these
30. Substances with high melting points generally have a) covalent b) polar bonds c) ionic bonds d) both (b) and (c)
31. 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
32. Which of the following is not determined by the number of protons in the nucleus of an atom? a) mass number b)atomic number c) number of electrons in the neutral atom d) name or type of atom
33. Plastic deformation occurs a) when the elastic limit is reached b) chiefly in ceramic materials c) only for metals d) only in plastics
34. A solid that consists of covalently bonded atoms such that the solid consists of one large a) micromolecular b)macromolecular c) amorphous d) ionic
35. The alloy bronze is made up of a) iron and carbon b) copper and zinc c) chromium and nickel d) copper and tin
36. Pressure applied to an enclosed liquid is a) transmitted undiminished b) reduced with distance c) described by an inverse square law d) both (a) and (c)
37. The buoyant force in a liquid a) increases with depth b) is independent of the liquid's density c) acts on all surfaces of an immersed object d) none of the preceding
38. In a full, closed container of a liquid, the pressure does not depend on a) the depth b) the liquid's mass density c) the acceleration due to gravity d) the shape of the container
39. Find the density of a 10-kg solid cylinder. The cylinder is 10 cm tall and has a radius of 3 cm. (a) 7.7 g/cm^3 (b) 17.7 g/cm^3 (c) 35.4 g/cm^3 (d) 35.4 g
40. Does Archimedes' principle tell us that if an immersed object displaces liquid weighing 10 N, what is the buoyant force? (a) 1 N (b) 2 N (c) 5 N (d) 10 N
41. The depth of water behind the Hoover Dam in Nevada is 220 m. What is the water pressure at the base of this dam? (Neglect the pressure due to the atmosphere.) (a) 200 kpa (b) 9800 kpa (c) 2160 kpa (d) 216 kpa
42. About how many kilograms of air occupy a classroom that has a 200-m^2 floor area and a 4-m-high ceiling? (density of air is 1.25 kg/m^3 at 10^oC) (a) 200 kg (b) 800 kg (c) 1000 kg (d) 2000 kg
43. Gusts of wind make the Sears Building in Chicago sway back and force at a vibration frequency of about .01 Hz. What is its period vibration? (a) 1 sec (b) 10 sec (c) 0.1 sec (d) 10 cycle/sec
44. If a water wave oscillates up and down three times each second and the distance between wave crests is 2m, what is its wave speed? (a) 2 m/sec (b) 6 m/sec (c) 4 m/sec (d) 1 m/sec
45. Radio waves travel at the speed of light – 300,000 km/s. What is the wavelength of radio waves received at 100.1 MHz on your FM radio dial? (a) 3 m (b) 100 m (c) 3 km (d) 100 km
46. What beat frequencies are possible with tuning forks of frequencies 256 Hz and 261 Hz? (a) 2 Hz (b) 3 Hz (c) 4 Hz (d) 5 Hz
47. What is the density of 1000 kg of water? (a) 1000 kg/cm^3 (b) 1 kg/m^3 (c) 1 g/cm^3 (d) 1 kg