

Physics 10 2nd Midterm (200 pts Max.) – Test B

Wednesday, Spring 2004

Please fill up the bubbles in your Scantron Answer Sheet fully and completely. It is your responsibility to make sure the bubbles are being filled.

1. 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)
2. An object sinks in a liquid when (a) the buoyant force is greater than the object's weight (b) it is completely immersed (c) its density is greater than that of the liquid (d) the weight of the displaced liquid is greater than that of the object
3. In a full, closed container of a liquid, the pressure does not depend on (a) the shape of the container (b) the liquid's mass density (c) the acceleration due to gravity (d) the depth
4. A fluid that flows slowly when poured from a container is said to have high (a) buoyancy (b) adhesion (c) viscosity (d) capillary action
5. Viscosity (a) decreases with increasing temperature (b) affects the pressure-depth relationship (c) is a factor in buoyancy (d) causes surface tension
6. One atmosphere of pressure will support a column of mercury how tall? (a) 30 cm (b) 76 in (c) 0.76 m (d) 760 in
7. Hot air rises because it is (a) less dense than the surrounding air (b) contained in a balloon (c) not covered by the gas laws (d) none of the preceding
8. The high pressure of the blood in its vessels is called (a) systolic (b) diastolic (c) barometric (d) atmospheric
9. When the volume of a gas is decreased (a) the pressure must increase (b) the density must increase (c) the temperature must increase (d) Boltzmann's constant changes
10. The heart is effectively a (a) force pump (b) lift pump (c) barometer (d) vacuum cleaner
11. Wave can propagate through (a) matter (b) space (c) time (d) both (a) and (b)
12. Intensity (a) is the same as energy (b) falls off as $1/r$ (c) has units of $J/s \cdot m^2$ (d) none of the preceding
13. When two waves interfere, which of the following add? (a) Displacement (b) Wavelength (c) Phase (d) None of these
14. Standing waves (a) have no motion at all (b) are always out of phase (c) have zero amplitude at the nodal positions (d) can have only one characteristic frequency
15. The propagation of energy through a medium or space from a disturbance is a(n) (a) oscillation (b) vibration (c) wave (d) harmonic
16. Sonar depends on sound (a) reflection (b) refraction (c) reverberation (d) resonance
17. 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) higher (b) lower (c) the same
18. The bel unit is a comparative measure of sound (a) frequency (b) quality (c) intensity level (d) none of these
19. The upper limit of the frequency range of human hearing is (a) 20 dB (b) 120 dB (c) 20 kHz (d) 10^9 Hz
20. A person hears thunder 4 seconds after seeing a lightning flash. The lightning was approximately how far away? (a) 1.3 km (b) 1.5 km (c) 2.6 km (d) 3.0 km
21. Thermal expansion, or an increase in dimensions with increasing temperature, occurs (a) in most substances (b) in very few substance (c) only in metals (d) both (b) and (c)
22. The degree Fahrenheit is equal to the unit interval on (a) the Celsius scale (b) the Kelvin scale (c) both (a) and (b) (d) none of the preceding
23. Which of the following heat units is neither the largest nor the smallest? (a) kilocalorie (b) Btu (c) calorie (d) all are equal

24. Which of the following units could be used for specific heat? (a) Cal/g° C (b) kcal/kg-K (c) Btu/lb-degree F (d) all of the preceding
25. The smallest temperature unit is (a) degree Fahrenheit (b) degree Celsius (c) the Kelvin (d) all are the same
26. The energy associated with a phase change is called (a) latent heat (b) specific heat (c) radiation (d) none of the preceding
27. Boiling starts in a heated liquid when the vapor pressure in formed bubbles is (a) negative (b) zero (c) greater than one atmosphere (d) below the triple-point pressure
28. Heat transfer takes place because of a difference in (a) potential energy (b) heat content (c) specific heat (d) temperature
29. Heating in a vacuum can take place by (a) conduction (b) convection (c) radiation
30. Ice, water, and steam coexist at the (a) melting point (b) dew point (c) boiling point (d) triple point
31. What would be the final temperature of a mixture of 50 g of 10° C water and 50 g of 50° C water? (a) 10°C (b) 20°C (c) 30°C (d) 40°C
32. What would be the final temperature when 100 g of 25° C water is mixed 75 g of 40° C water? (Hint: Equate the heat gained by the cool water to the heat lost by the warm water) (a) 31.4°C (b) 31.4°F (c) 31.4°K (d) 22.1°C
33. Suppose a bar 1 m long expands 0.8 cm when heated. By how much will a bar 100 m long of the same material expand when similarly heated? (a) 100.5 m (b) 100.8 m (c) 100 m (d) 10 m
34. Does Archimedes' principle tell us that if an immersed object displaces liquid weighing 10 N, what is the buoyant force? (a) 10 N (b) 5 N (c) 20 N (d) 30 N
35. The depth of water behind the Hoover Dam in Nevada is 220m. What is the water pressure at the base of this dam? (Neglect the pressure due to the atmosphere.) (a) 220 kPa (b) 2160 kPa (c) 220 kg (d) 220 N
36. When a 2.0-kg object is suspended in water, it "masses" 1.5 kg. What is the density of the object? (a) 1000 kg/m³ (b) 4000 kg/m³ (c) 500 kg/m³ (d) 2000 kg/m³
37. About how many kilograms of air occupy a classroom that has a 200m² floor area and a 4-m-high ceiling? (Assume a chilly 10 degree temperature.) (a) 1000 kg (b) 800 kg (c) 125 kg (d) 1000m³
38. What is the frequency in vibrations per second of 60-Hz wave? What is its period? (a) 0.01666 sec (b) 60 sec (c) 0.0332 sec (d) 30 sec
39. If a train of friegh cars, each 10m long, rolls by you at the rate of three cars each second. What is the speed of the train? (a) 10 m/sec (b) 20 m/sec (c) 30 m/sec (d) 30 m
40. What beat frequencies are possible with tuning forks of frequencies 256, 259, and 261 Hz? (a) 1 Hz (b) 2 Hz (c) 3 Hz (d) 4 Hz
41. A cello string 0.75 long has a 220-Hz fundamental frequency. Find the wave speed along the vibrating string. (a) 660 m/sec (b) 330 m/sec (c) 330 m (d) 660 m
42. A bat flying in a cave emits a sound and receives its echo 0.1 s late. How far away is the cave wall? (a) 17 m (b) 34 m (c) 51 m (d) 102 m
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46. Find the mass of 0° C ice that 10 g of 100° C steam will completely melt. (a) 80 gm (b) 40 gm (c) 160 gm (d) 200 gm
47. Convert the temperature -30°C to the Fahrenheit scale: (a) 32°F (b) -22°F (c) 14°C (d) 10°F
48. What is the Kelvin temperature when the Fahrenheit and Celsius temperatures are equal? (a) 40K (b) -40C (c) -40F (d) 233K