

Physics 295 Ch 14 Multiple Choice Problems

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ____ 1. Find the pressure in atmospheres at the base of Dworshak Dam if the water in the reservoir is 200 meters deep. ($10^5 \text{ N/m}^2 = 1 \text{ ATM.}$)
- 20.6 ATM
 - 24.7 ATM
 - 29.4 ATM
 - 196 ATM
 - 75 ATM
- ____ 2. Some species of whales can dive to depths of 1 kilometer. What is the total pressure they experience at this depth? ($\rho_{\text{sea}} = 1020 \text{ kg/m}^3$ and $10^5 \text{ N/m}^2 = 1 \text{ ATM.}$)
- 9 ATM
 - 90 ATM
 - 101 ATM
 - 111 ATM
 - 130 ATM
- ____ 3. A blimp is filled with 200 m^3 of helium. How much mass can the balloon lift? The density of helium is $1/7$ that of air, and the density of air is $1/800$ that of water.
- 115 kg
 - 214 kg
 - 315 kg
 - 415 kg
 - 37 kg
- ____ 4. What fraction of an iceberg is submerged? ($\rho_{\text{ice}} = 917 \text{ kg/m}^3$, $\rho_{\text{sea}} = 1.03 \times 10^3 \text{ kg/m}^3$.)
- 95%
 - 93%
 - 91%
 - 89%
 - 77%
- ____ 5. A supertanker filled with oil has a total mass of $6.1 \times 10^8 \text{ kg}$. If the dimensions of the ship are those of a rectangular box 300 meters long, 80 meters wide, and 40 meters high, determine how far the bottom of the ship is below sea level. ($\rho_{\text{sea}} = 1020 \text{ kg/m}^3$.)
- 10 m
 - 15 m
 - 20 m
 - 25 m
 - 30 m
- ____ 6. A hydraulic lift raises a 2000-kg automobile when a 500-N force is applied to the smaller piston. If the smaller piston has an area of 10 cm^2 , what is the cross-sectional area of the larger piston?
- 40 cm^2
 - 80 cm^2
 - 196 cm^2
 - 392 cm^2
 - 160 cm^2
- ____ 7. Water is flowing at 4.0 m/s in a circular pipe. If the diameter of the pipe decreases to $1/2$ its former value, what is the velocity of the water downstream?

- a. 1.0 m/s
- b. 2.0 m/s
- c. 8.0 m/s
- d. 16 m/s
- e. 4.0 m/s

- _____ 8. A fountain sends water to a height of 100 meters. What must be the pressurization (above atmospheric) of the water system? $1 \text{ ATM} = 10^5 \text{ N/m}^2$.
- a. 1.0 ATM
 - b. 4.2 ATM
 - c. 7.2 ATM
 - d. 9.8 ATM
 - e. 8.2 ATM
- _____ 9. In a wind tunnel the pressure on the top surface of a model airplane wing is $8.8 \times 10^4 \text{ N/m}^2$ and the pressure on the bottom surface is $9.0 \times 10^4 \text{ N/m}^2$. If the area of the top and bottom surfaces of each wing is 2.0 m^2 , what is the total lift on the model airplane?
- a. $2.0 \times 10^3 \text{ N}$
 - b. $8.0 \times 10^3 \text{ N}$
 - c. $1.6 \times 10^4 \text{ N}$
 - d. $3.6 \times 10^4 \text{ N}$
 - e. $1.0 \times 10^3 \text{ N}$
- _____ 10. A venturi tube may be used as the inlet to an automobile carburetor. If the 2.0-cm diameter pipe narrows to a 1.0-cm diameter, what is the pressure drop in the constricted section for an airflow of 3.0 cm/s in the 2.0-cm section? ($\rho = 1.2 \text{ kg/m}^3$.)
- a. 70 Pa
 - b. 85 Pa
 - c. 100 Pa
 - d. 115 Pa
 - e. 81 Pa
- _____ 11. A hose has been clamped so that the area at the clamp is only one quarter the area of the rest of the hose. When we ignore the viscosity of water, the ratio of the speed of the water through the clamped area to the speed of the water when it leaves the hose is
- a. $\frac{1}{4}$.
 - b. $\frac{1}{2}$.
 - c. 1.
 - d. 2
 - e. 4.

Physics 295 Ch 14 Multiple Choice Problems Answer Section

MULTIPLE CHOICE

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|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: D | PTS: 1 |
| 5. ANS: D | PTS: 1 |
| 6. ANS: D | PTS: 1 |
| 7. ANS: D | PTS: 1 |
| 8. ANS: D | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: E | PTS: 1 |
| 11. ANS: E | PTS: 1 |