

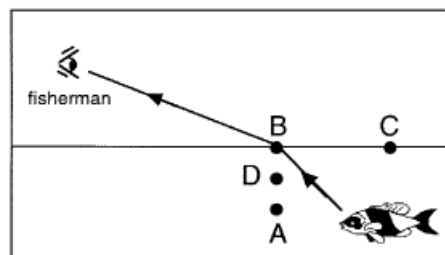
Review 4

Waves

1. Explain, with the help of a sketch, what each of these terms means with respect to waves:
 - (a) crest;
 - (b) trough;
 - (c) wavelength;
 - (d) frequency;
 - (e) amplitude.
2. A dog wags its tail 50 times in 20 s. What are (a) the frequency and (b) the period of vibration of the tail?
3. Explain the difference between refraction and diffraction. Give an example of each phenomenon from everyday experience.
4. When waves slow down on entering a new medium, what happens to
 - (a) their wavelength?
 - (b) their frequency? and
 - (c) their direction?Under what conditions will the direction *not* change?
5. What is
 - (a) constructive interference?
 - (b) destructive interference?
6. What is the Doppler Effect? What causes it?
7. A beam of light makes an angle of 35° with the normal as it approaches a flat glass block. If the index of refraction of the glass is 1.60, at what angle will the refracted beam enter the glass, relative to the normal? At what angle will the beam leave the other side of the block of glass if the walls are parallel?
8. What is the critical angle for a glass that has an index of refraction of 1.52?
9. The critical angle of a liquid is 45° . What is the index of refraction of the liquid?
10. What phenomena are primarily involved in the making of a rainbow?
 - A. reflection and refraction
 - B. reflection and interference
 - C. reflection, refraction and dispersion
 - D. refraction, interference and diffraction

11. What property of light is used in lenses?
 - A. refraction
 - B. reflection
 - C. diffraction
 - D. interference
12. When a prism spreads light into its component colours, what is the phenomenon called?
 - A. reflection
 - B. diffraction
 - C. interference
 - D. dispersion
13. Sun tan and sun burn are caused by
 - A. infrared light.
 - B. ultraviolet light.
 - C. red light.
 - D. all visible wavelengths.
14. When light of a certain pure colour enters a new medium at, say, 30° , what property of the light does *not* change?
 - A. speed
 - B. direction
 - C. frequency
 - D. wavelength

15. Where should the fisherman aim his spear if the fish, which is not moving, is to be eaten tonight?
 - A. At A
 - B. At B
 - C. At C
 - D. At D

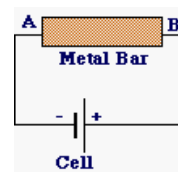


16. A beam of light from air enters a liquid at an incident angle of 35° . It refracts at 25° to the normal. What is the **index of refraction** of the liquid?
 - A. 0.71
 - B. 1.4
 - C. 0.74
 - D. 10°
17. Diamond has an index of refraction of 2.42. If light enters from air the diamond at an angle of incidence of 63.0° , at what angle will the light refract?
 - A. 0.3682°
 - B. 2.42°
 - C. 21.6°
 - D. 26.0°
18. Light speed is 3.00×10^8 m/s in air. What is its speed in a plastic, whose index of refraction is 1.453?
 - A. 2.06×10^8 m/s
 - B. 3.00×10^8 m/s
 - C. 4.36×10^8 m/s
 - D. 0.484×10^8 m/s

Circuits

19. What direction would conventional current flow through the metal bar shown below?

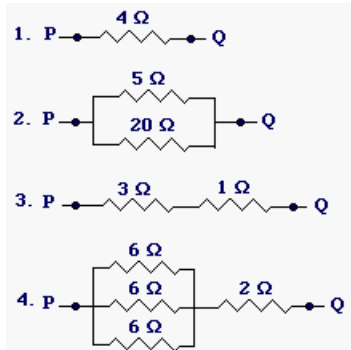
- a. up
- b. down
- c. from A to B
- d. from B to A



20. Electrical current is described as the....

- a. speed at which electrons flow in a wire.
- b. net charge transfer per unit time.
- c. number of neutrons passing a point every second.
- d. amount of electrical energy flowing in a wire

21. Which of the following connections have the same equivalent resistance between points P and Q?



- a. Only 1 and 2
- b. Only 1, 2, and 3
- c. Only 1, 2, and 4
- d. 1, 2, 3, and 4

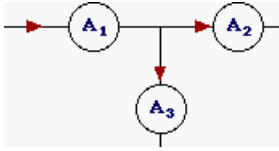
22. What is the resistance of a toaster that uses 4.0 A on a 110 V line?

- a. $440\ \Omega$
- b. $27.5\ \Omega$
- c. $4.0\ \Omega$
- d. $0.036\ \Omega$

23. What is the resistance of a 110 V appliance that draws 300 mA current?

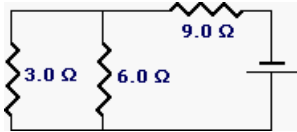
- a. $367\ \Omega$
- b. $0.37\ \Omega$
- c. $33\ \Omega$
- d. $37\ \Omega$

24. Three ammeters are located in an electric circuit as shown. If A_1 reads 8 A and A_2 reads 2 A, what is the reading on A_3 ?



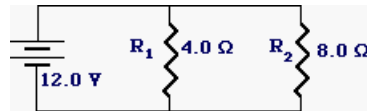
- a. 16 A
- b. 6 A
- c. 5 A
- d. 4 A

25. In the circuit below, the current through the 3.0Ω resistor is 1.0 A. What is the current through the 9.0Ω resistor?



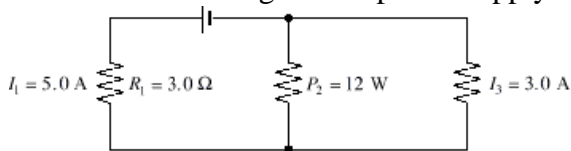
- a. 1.0 A
- b. 1.5 A
- c. 2.0 A
- d. 3.0 A

26. The diagram shows two different resistors connected in parallel across a 12.0 V battery. What is the power dissipated by resistor R_2 ?



- a. 18 W
- b. 54 W
- c. 81 W
- d. 160 W

27. What is the voltage of the power supply shown in the diagram?

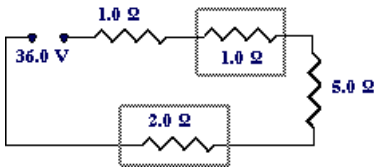


- a. 12 V
- b. 19 V
- c. 21 V
- d. 27 V

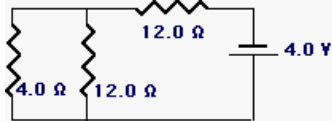
28. What is the equivalent resistance of a 120 V household circuit which has TWO 150 W and TWO 75 W light bulbs turned on?

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29. What is the total resistance in the circuit? Complete the V, I, R chart

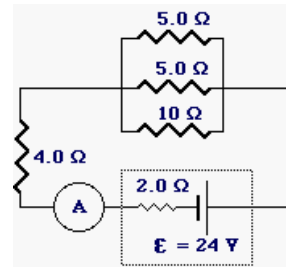


30. How much power is produced by the 4.0 Ω resistor? Complete the V, I, R, P chart.



31. What is the potential drop across through the 4.0 Ω resistor?

- a. 3 V
- b. 4 V
- c. 12 V
- d. 24 V



Answers:

- 1) See solution sheet, 2) 2.5 Hz, 0.40 s, 3)-6) See solution sheet, 7) 21°, 8) 41°, 9) 1.41, 10) C, 11) A, 12) D, 13) A, 14) C, 15) D, 16) B, 17) C, 18) A, 19) d, 20) b, 21) d, 22) b, 23) a, 24) b, 25) b, 26) a, 27) c, 28) 32Ω, 29) 9Ω, 30) 0.16W, 31) c