ALBERTA SCIENCE 30 · UNIT C · 25 QUESTIONS

Electromagnetic Energy — Practice Test

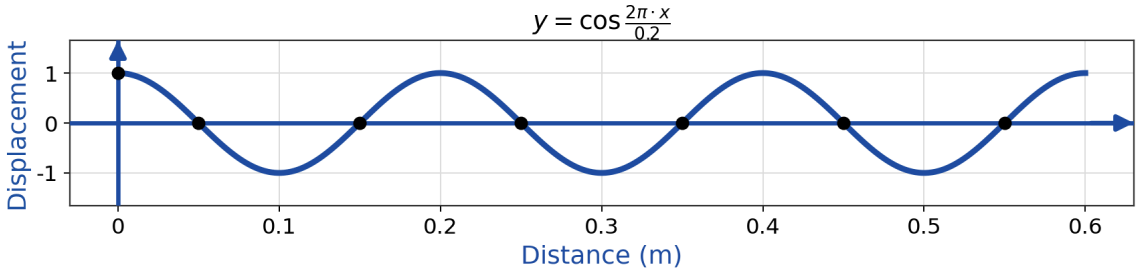
This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Which type of electromagnetic radiation has the highest frequency?**

- A Radio waves
- B Infrared radiation
- C Gamma rays
- D Microwaves

Understand It with Pulse | Flag a mistake

2 **The graph below shows a wave. Using $c = 3.00 \times 10^8$ m/s, the frequency of this wave is**



A 1.50×10^9 Hz

B 6.00×10^8 Hz

C 3.00×10^9 Hz

D 7.50×10^8 Hz

Understand It with Pulse | Flag a mistake

3 **A ray of light strikes a plane mirror. The angle of incidence is 35°. The angle of reflection is**

- A 55°
- B 35°
- C 70°
- D 17.5°

Understand It with Pulse | Flag a mistake

4 **When light travels from air into water, the property of the light that remains unchanged is its**

- A speed
- B wavelength
- C direction
- D frequency

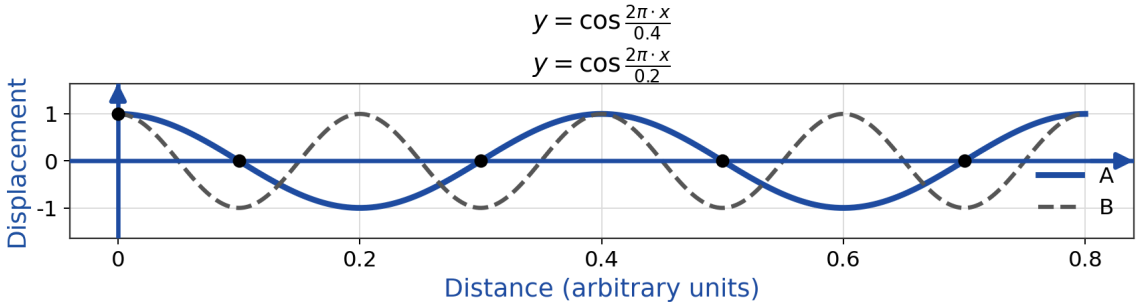
Understand It with Pulse | Flag a mistake

5 **Green light has a wavelength of 5.30×10^{-7} m. The frequency of this light, in units of 10^{14} Hz to the nearest hundredth, is ____**

ANSWER

Understand It with Pulse | Flag a mistake

6 **The graph below shows two waves, A and B. The frequency of wave B, compared with the frequency of wave A, is**



A higher

B lower

C the same

D zero

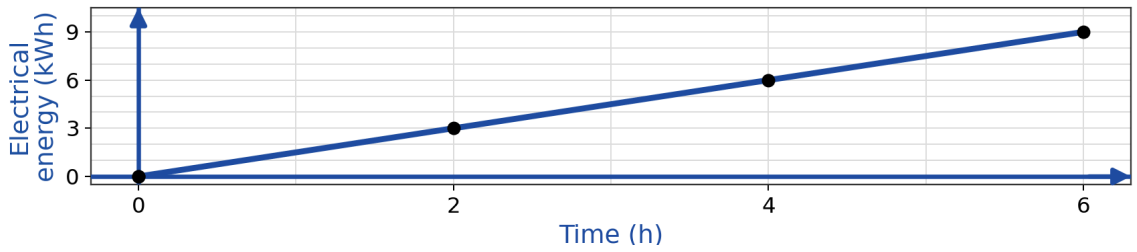
Understand It with Pulse | Flag a mistake

7 **Television remote controls communicate with the television using**

- **A** ultraviolet radiation
- **B** infrared radiation
- **C** X-rays
- **D** gamma rays

Understand It with Pulse | Flag a mistake

8 **The graph below shows electrical energy used by an appliance against time. The power rating of the appliance is**



- **A** 0.75 kW
- **B** 1.50 kW
- **C** 3.00 kW
- **D** 9.00 kW

Understand It with Pulse | Flag a mistake

9 **Overexposure to ultraviolet radiation from the Sun is most closely associated with**

A hearing loss

B skin damage and an increased risk of skin cancer

C increased muscle growth

D tooth decay

Understand It with Pulse | Flag a mistake

10 **An X-ray has a frequency of 3.00×10^{18} Hz. Its wavelength, in units of 10^{-10} m, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

11 **A ray of light travelling in air enters a block of glass at an angle. Because the light slows down in the glass, the ray bends**

- **A** toward the normal
- **B** away from the normal
- **C** along the surface of the glass
- **D** back on itself

Understand It with Pulse | Flag a mistake

12 **Total internal reflection can occur when light travels**

- **A** from a less optically dense medium to a more optically dense medium
- **B** from air into water at any angle of incidence
- **C** from a more optically dense medium to a less dense one, at an angle greater than the critical angle
- **D** along the normal to the surface

Understand It with Pulse | Flag a mistake

13 **Resistors are connected in parallel across a battery. As additional resistors are added in parallel, the total resistance of the circuit**

A remains the same

B increases

C decreases

D becomes infinite

Understand It with Pulse | Flag a mistake

14 **A photon has a frequency of 6.00×10^{14} Hz. Using $h = 6.63 \times 10^{-34}$ J · s, the energy of the photon, in units of 10^{-19} J to the nearest hundredth, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

15 **An appliance rated at 2.00 kW runs for 5.0 h. If electricity costs 0.12 dollars per kWh, the cost of operating the appliance is**

A 12.00 dollars

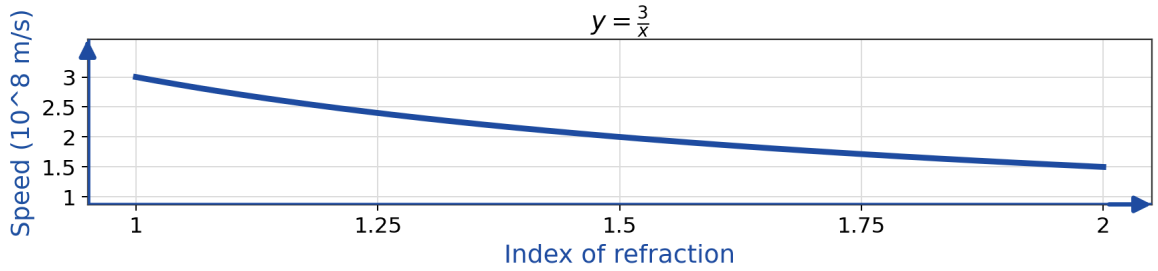
B 0.12 dollars

C 0.83 dollars

D 1.20 dollars

Understand It with Pulse | Flag a mistake

16 **The graph below shows the speed of light in a material against its index of refraction. For a material with an index of refraction of 1.50, the speed of light, in units of 10^8 m/s, is**



A 1.50

B 2.00

C 2.50

D 3.00

Understand It with Pulse | Flag a mistake

17 **Which list places the types of electromagnetic radiation in order of increasing wavelength?**

A radio, microwave, infrared, visible, ultraviolet, X-ray, gamma

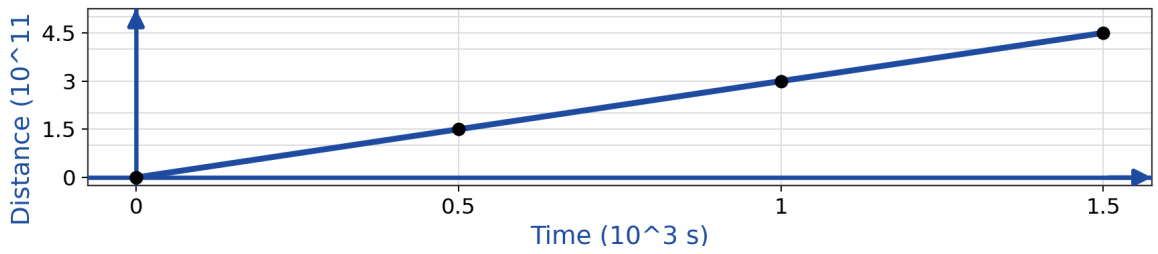
B visible, ultraviolet, infrared, X-ray, microwave, gamma, radio

C gamma, X-ray, ultraviolet, visible, infrared, microwave, radio

D microwave, radio, infrared, visible, ultraviolet, X-ray, gamma

Understand It with Pulse | Flag a mistake

18 **The graph below shows the distance travelled by a signal from a space probe against time. The time taken for the signal to travel 4.50 × 10^{11} m, in units of 10^3 s to the nearest hundredth, is _____**



ANSWER _____

Understand It with Pulse | Flag a mistake

19 **A circuit breaker protects the wiring in a house by**

- **A** increasing the current in the circuit
- **B** storing electrical charge for later use
- **C** opening the circuit when the current becomes too large
- **D** changing alternating current into direct current

Understand It with Pulse | Flag a mistake

20 **A microwave oven rated at 1.50 kW operates for 0.500 h. The electrical energy it uses, in kilowatt hours, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

21 **A drinking straw standing in a glass of water appears to be bent at the surface of the water. This effect is caused by the**

- **A** refraction of light
- **B** reflection of light
- **C** absorption of light
- **D** diffraction of light

Understand It with Pulse | Flag a mistake

22 **Fibre-optic cables are able to carry light signals over long distances because the light undergoes repeated**

- **A** refraction out of the cable
- **B** absorption by the glass
- **C** scattering in all directions
- **D** total internal reflection

Understand It with Pulse | Flag a mistake

23 **A 24 V battery is connected to two resistors in series, of 6.0 Ω and 10.0 Ω. The current through the circuit, in amperes, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

24 **Which type of electromagnetic radiation is used in germicidal lamps to sterilize medical equipment by killing bacteria?**

A Ultraviolet radiation

B Microwaves

C Radio waves

D Infrared radiation

Understand It with Pulse | Flag a mistake

25 **Light slows to a speed of 2.25×10^8 m/s in a clear liquid. The index of refraction of the liquid, to the nearest hundredth, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

ANSWER KEY

1.	C	**10.**	1	**19.**	C
2.	A	**11.**	A	**20.**	0.75
3.	B	**12.**	C	**21.**	A
4.	D	**13.**	C	**22.**	D
5.	5.66	**14.**	3.98	**23.**	1.5
6.	A	**15.**	D	**24.**	A
7.	B	**16.**	B	**25.**	1.33
8.	B	**17.**	C		
9.	B	**18.**	1.5		

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