PHYSICS

BOOKS - BINA LIBRARY PHYSICS (ASSAMESE ENGLISH)

ELEMENTS OF PHYSICS ii

Exercise

1. A sinusoidally varying potential difference has amplitude 170V. What is its rms value?

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2. Name the scientist who predicted the existence of electromagnetic waves.

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3. Name the scientist who first demonstrated the existence of electromagnetic waves.

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4. State the wavelength range of visible region.

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5. Which part of the electromagnetic spectrum carries heat energy?

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6. Name the part of electromagnetic spectrum which is suitable for radar system.

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7. Write down the expression of velocity of electromagnetic wave in free space.

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8. What oscillates in electromagnetic waves? Are these waves transverse or longitudinal?

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9. Name the characteristics of e.m waves that (i) increases, (ii) remains constant as one moves from radio wave to ultraviolet regions in electromagnetic spectrum

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10. Write the relationship between amplitudes of electric and magnetic fields in free space for e.m. wave.

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11. Which part of the e.m. spectrum has largest penetrating power?

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12. Arrange in descending order of wavelength γ-rays, x-rays and visible light.

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13. Name the e.m. radiations used for studying crystal structure of solids.

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14. What is the ratio of speed of infra-red rays and ultraviolet rays in vaccum?

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15. How does a charge 'q' oscillating at certain frequency produce electromagnetic waves?

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16. Write down the four Maxwell's equations.

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17. When a boat is moving in the river, does the water offer force of friction to its movement ?

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18. What are x-rays? State two important uses of it.

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19. Explain qualitatively that an e.m. wave can propagate without material medium.

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20. What is the wavelength range of γ-rays ? State two uses of γ-rays.

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21. State various uses of radiowaves.

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22. Why does friction increase if the two surfaces are pressed ?

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23. Give three examples to show that friction is increased deliberately

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24. What are microwaves?

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25. The electric field vector of a plane e.m. wave oscillates with frequency $2 \times 10^{10} S^{-1}$ and an amplitude of 40 $Vm - 1$. What is the wavelength?

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26. The electric field vector of a plane e.m. wave oscillates with frequency $2 \times 10^{10} S^{-1}$ and an amplitude of 40 $Vm - 1$. What is the energy density due to electric field?

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27. In an e.m. wave amplitude of electric field is $E_0 = 60 \frac{N}{C}$ and its frequency is f = 50 MHz. Determine B_0,ω,K and γ.

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28. In an e.m. wave amplitude of electric field is $E_0 = 60\frac{N}{C}$ and its frequency is f = 50 MHz. Find expressions for $\overrightarrow{E}$ and $\overrightarrow{B}$.

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29. About 10% of the power of a 100W light bulb is converted to a visible radiation. What is the average intensity of visible radiation. at a distance of 1m from the bulb?

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30. About 10% of the power of a 100W light bulb is converted to a visible radiation. What is the average intensity of visible radiation. at a distance of 10 m?

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31. Name the radiations of electromagnetic spectrum which are used in warfare to look through fog.

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32. Name the part of electromagnetic spectrum which is suitable for radar system.

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33. Name the radiations of electromagnetic spectrum which are used in studying structures and properties of atoms and molecules.

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34. Name the constituent radiation of e.m. spectrum which is used in satellite communication.

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35. Name the e.m. radiations used for studying crystal structure of solids.

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36. Name the constituent radiation of e.m. spectrum which is absorbed from sunlight by ozone layer.

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37. Name the constituent radiation of e.m. spectrum which produces intense heating effect.

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38. Why are microwave used in Radar?

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39. State the condition under which a microwave oven heats up food item containing water molecules most efficiently.

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40. Maxwell's equations describe the fundamental laws of

A. electricity only -

B. magnetism only

C. mechanics only

D. both (a) and (b).

Answer: D

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41. According to Maxwell a changing electric field gives rise to

A. an cmf

B. electric current

C. magnetic field

D. pressure variation

Answer: C

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42. An electric charge in uniform motion produces

A. an electric field only

B. a magnetic field only

C. both electric and magnetic fields

D. no such field at all.

Answer: C

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43. Infra-red spectrum lies between

A. radio wave and microwave region

B. microwave and visible region

C. visible and ultraviolet region

D. ultraviolet and X-ray.

Answer: B

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44. The frequencies of x-rays, y-rays and ultraviolet rays are respectively a, b and c. Then

A. $a < b, b > c$

B. $a > b, b > c$

C. $a > b, b < c$

D. $a < b, b < c$.

Answer: A

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45. An accelerated electron would produce

A. $\alpha rays$

B. $\beta rays$

C. $\gamma rays$

D. E-M rays

Answer: D

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46. Microwaves are clectromagnetic waves with frequency in the range of

A. micro hertz

B. mega hertz

C. giga hertz

D. hertz.

Answer: C

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47. Which of the following is infra-red wavelength ?

A. $10^{-4}cm$

B. $10^{-5}cm$

C. $10^{-6}cm$

D. $10^{-7}cm$

Answer: A

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