

Important Question of Applied Physics-I

1. Explain in detail Carnot Cycle and derive an expression for its efficiency.
2. Explain continuum approach in Thermodynamics.
3. Given two moles of a perfect monoatomic gas, initially kept in a cylinder at a pressure $1.0 \times 10^6 \text{ Nm}^{-2}$ and temperature 27°C , are made to expand until its volume is doubled. Calculate work done if the expansion is (i) isobaric and (ii) isothermal
4. If the door of a refrigerator remains open, then why a room cannot be cooled? Explain your answer.
5. Give the equation of continuity of electromagnetic theory. Explain the inconsistency of Ampere's law for transient currents. How was the law modified in its generalized form to overcome the inconsistency.
6. Show that the velocity of the electromagnetic wave in a dielectric medium is always less than the velocity in free space
7. State the theorem showing conservation of energy in electromagnetism .Give the physical significance of the important vector quantity defined in the above mentioned theorem.
8. Discuss the propagation of monochromatic plane electromagnetic wave in a conducting medium. What do you understand by the skin depth.
9. Explain the formation of fringes in Michelson's Interferometer with suitable diagram
10. Explain using mathematical derivation the formation of the n^{th} bright ring in a Newton's ring set up in the reflected light with a diameter given by two expression
11. In a diffraction grating how are spectral lines affected when ruling are made closer.
12. What is meant by resolving power and dispersive power of an optical instrument?
13. How would you distinguish between plane ,circular and elliptically polarised light?
14. Write short note on Nicol prism.
15. Discuss the negative result of Michelson-Morley experiment and conclusion drawn therefrom.
16. Why do we not observe the effect of time dilation in everyday phenomenon?
17. Define coherence .Distinguish between spatial and temporal coherence.
18. Describe qualitatively 4 level laser scheme. Do you think energy conservation is violated in lasing atom
19. State fundamental postulates of special theory and deduce the Lorentz transformations from them.
20. Prove that no material particle can attain a velocity greater than the velocity of light