

Optics And Modern Physics

- Q.1 Distinguish between Analog and digital form of communication.
- Q.2 Can white light be used to produce sustained interference?
- Q.3 Can converging lens be made to act like a diverging lens?
- Q.4 Explain the Hertz experiment for generation of electromagnetic waves.
- Q.5 Derive relation between real depth and apparent depth, when an object is placed in denser medium of refractive index μ .
- Q.6 Write symbol and truth table for NAND gate and XOR gate.
- Q.7 What is rectifier? How can use diode to function as half wave rectifier?
- Q.8 Explain the functioning of npn transistor as common emitter amplifier. Write voltage gain, current gain and power gain. Why common emitter configuration is preferred over common base?
- Q.9 What is the effect on interference pattern in YDS if [a] screen is moved away from the plane of slits [b] separation between slits is increased [c] whole set up is immersed in water.
- Q.10 An electron and proton have same kinetic energy. Which of the two will have greater wavelength?
Are matter waves electromagnetic? What is momentum of photon of frequency ν ?
- Q.11 A nucleus Ne_{10}^{23} undergoes beta decay to form Na_{11}^{23} . Calculate the kinetic energy of the electron emitted if mass of Ne= 22.9944664u and Na= 22.989770u. Rest mass of electron may be ignored.
- Q.12 Explain using block diagram how amplitude modulated wave is produced.
- Q.13 [a] Write two factors which justify the need for modulating a signal
[b] calculate the length of dipole antenna for carrier wave of frequency 6×10^8 Hz
- Q.14 Derive expression for de-broglie wavelength of an electron moving under potential difference of V volt. Describe davisson and Germer experiment to establish the wave nature of the electrons. Draw well labeled diagram of apparatus used.
- Q.15 How could you estimate the rough focal length of converging lens? Draw a diagram to show the image formation for converging lens and thus derive lens maker's formula. Plot the graph showing variation of $1/u$ Vs. $1/v$