

Questions for Assignment

B. Sc IInd Semester YEAR 2020

Department of Physics DAV PG College Dehradun

Electricity and Magnetism

Attempt Any four questions out of following

All Question carry equal marks. Total Marks 30

Question 1. Explain Biot-Savart law. Using this law find an expression for the magnetic field on the axis of a circular current loop. Also show the variation of magnetic field.

Question 2. State and explain Faraday's laws of electromagnetic induction. Define self-inductance and mutual inductance

Question 3. State and derive Gauss Law of Electrostatics . Calculate Electric field due to Charged Solid Sphere.

Question 4. Derive Maxwell's four equations of Electromagnetic theory and explain their physical significance

Question 5. Obtain the expression for the magnetic energy stored in a solenoid in terms of magnetic field B , area A and length l of the solenoid. How does this magnetic energy compare with the electrostatic energy stored in a capacitor?

Question 6 . Derive expression of capacitance in a parallel plate capacitor. By using Gauss law calculate the electric field between the plates and potential difference between the plates of parallel plate capacitor.

Question 7. Calculate the energy stored in a spherical shell having radius a and Charge and verify that the energy of the system is equal to the work done in charging the sphere.

Question 8. State and derive Gauss Divergence theorem .

Questions for Assignment

B. Sc IVth Semester 2020

Waves and Optics

Department of Physics DAV PG College Dehradun

Attempt Any four of the following questions

All Question carry equal marks. Total Marks 30

Question 1. Explain Huygen's principle for propagation of light. Explain the phenomena of refraction and derive Snell's law on the basis of wave theory of light.

Question 2. Describe the construction and working of the Michelson's interferometer. How this interferometer may be used to obtain: (i) circular fringes (ii) straight line fringes.

Question 3. Derive and solve the equation of forced harmonic oscillator and discuss
(i) Quality Factor (ii) Sharpness of Resonance (iii) Relaxation Time

Question 4. Apply Fourier Theorem to analyse a saw tooth wave.

Question 5.. In Young's Double slit experiment derive the condition of constructive and destructive interference

Question 6 . Derive equation for superposition of two waves and explain in order form an interference pattern, the incident light must satisfy which two conditions?

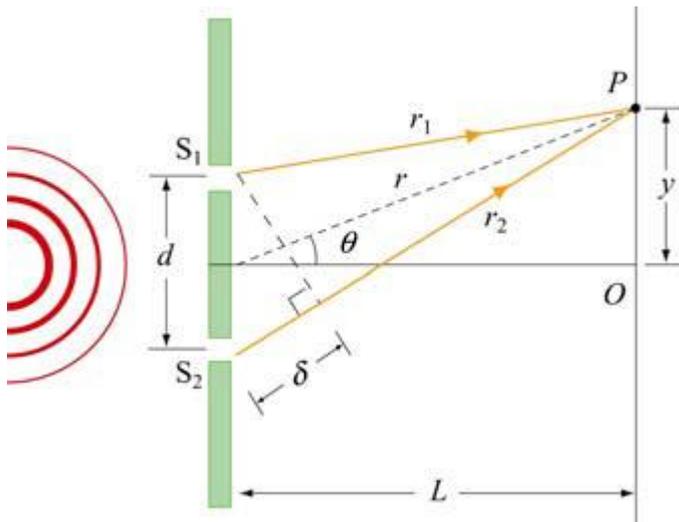
Question 7. In the double-slit interference experiment shown in Figure, suppose $d=0.100$ mm and $L=1.00$ m , and the incident light is monochromatic with a wavelength $\lambda=500$ nm. , then

(a) What is the phase difference between the two waves arriving at a point P on the screen when $0.8000\theta=^\circ$?

(b) What is the phase difference between the two waves arriving at a point P on the screen when?

(c) If $\phi =1/3$ rad, what is the value of θ ?

(d) If the path difference is $\frac{1}{4}\delta\lambda$, what is the value of θ ?



Double-slit experiment

Question 8: Explain Newton's ring experiment. How wavelength of sodium light is measured and refractive index of medium is derived?

or

Explain working of Michelson Interferometer.

Questions for Assignment 2020

B. Sc VIth Semester

Quantum Mechanics

Department of Physics DAV PG College Dehradun

Attempt any four questions out of following

All Question carry equal marks.

Total Marks 30

Question 1. Derive time dependent and time independent Schrodinger Equations and give physical interpretation of wave function.

Question 2. Explain briefly normal and anomalous Zeeman effect. Discuss the Zeeman pattern of the resonance (D_1 , D_2) lines of sodium.

Question 3. Explain how an expectation value is based upon the statistical interpretation of the wave function. What is expectation value of a stationery state?

Question 4. (a) Define and explain Momentum Operator. What is expectation value of Momentum (b) Define and Explain Energy Operator. Obtain expectation value of Energy.

Question 5 Derive time independent Schrodinger equation in spherical polar coordinates

Question 6. A beam of electrons is accelerated through a potential of 5 V toward a potential barrier of width 0.8 nm and height 10 eV. What fraction of the electrons tunnel through the barrier?

Question 7 Write short notes on (a) Gyromagnetic ration and (b) Bohr Magneton

Question 8 Write Short notes on (i) L-S Coupling (ii) J-J coupling

Questions for Assignment

B. Sc VIth Semester (Skill) ELECTRONICS-II (Amplifiers and Oscillators)

Department of Physics DAV PG College Dehradun

Attempt any Four of the following questions

All Question carry equal marks. Total Marks 30

Q1. What are Power amplifiers Describe difference among Class A Pushpull class B and class C Amplifiers.

Q2. Describe construction and working of FET Amplifiers

Q3 What do you mean by feedback amplifier? What is benefit negative feed back, describe through diagram.

Q4. What is function of oscillator in electronic circuits. explain Hartley Oscillator in details with suitable diagram.

Q5. Describe working and function of bistable multivibrator.

Q6. What do you mean by Distortions in amplifier. What are phase distortion, amplitude distortion and frequency distortion?