VP & RPTP Science College

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B.Sc. (Semester - 4) Subject: Physics Course: US04CPHY01

Title of the paper: Electromagnetic Theory and Spectroscopy

Internal Test

Date: 14-3-2016, Monday Time: 3.00 pm to 4.30 pm Total Marks: 25

Q-1 MCQs: [3]

1. The equation $\nabla^2 V = -\frac{\rho}{\epsilon_0}$ is called _____.

   (a) Laplace's equation (b) Poisson's equation
   (c) Maxwell's equation (d) none of these

2. The equation for curl of B, $\nabla \times B = \mu_0 J$ is called _____.

   (a) Ampere's law (b) Gauss's law
   (c) Coulomb's law (d) none of these

3. The effect of magnetic field on the spectrum is known as _____.

   (a) Zeeman effect (b) Stark effect (c) Hall effect (d) Raman effect

Q-2 Short Questions [Attempt any TWO]: [4]

1. Explain: electric field.
2. Write and discuss continuity equation.
3. Define and explain importance of wave number in spectroscopy.

Q-3 Write a note on: (a) divergence of **E** and (b) curl of E. [6]

OR

Q-3 Explain electric potential and give comments on the potential. [6]

Q-4 Explain: (a) $\nabla \cdot \mathbf{B}$ and (b) $\nabla \times \mathbf{B}$. [6]

OR

Q-4 State Biot-Savart law. Using the Biot-Savart law, find the magnetic field a distance s from a long straight wire carrying steady current **I**. [6]

Q-5 Discuss: (a) Line Spectra and (b) Band Spectra. [6]

OR

Q-5 Explain: (a) **L-S** Coupling and (b) **j-j** Coupling. [6]

**********Wish You All the Best.