

# V P & R P T P Science College

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

Title of the paper: Electromagnetic Theory and Spectroscopy

Date: 10-03-2014, Monday

Time: 1 pm to 2.30 pm

Total Marks: 30

Q-1 Attempt any THREE questions: [6]

- (a) State and Explain Coulomb's law.
- (b) Derive Poisson's equation.
- (c) Prove that magnetic forces do not work. What does it imply?
- (d) Write and explain implication of continuity equation.
- (e) State Bragg's law for X-ray diffraction.
- (f) Discuss any two differences between optical spectra and X-ray spectra.

Q-2 Explain:

[a] Electric field.

[b] Electric potential.

[4]

[4]

OR



Q-2 Describe:

[a] Electric field lines, flux and Gauss's law.

[b] Work and energy in electrostatics.

[4]

[4]

Q-3 Explain:

[a] Magnetic field.

[b] Magnetic vector potential.

[4]

[4]

OR

Q-3 Describe:

[a] Multipole expansion of the vector potential.

[b] Divergence and curl of B.

[4]

[4]

Q-4 Write a short note on continuous X-ray spectrum.

[8]

OR

Q-4 State and explain Moseley's law. Derive Moseley's law on the basis of Bohr's theory of an atom. Discuss any two applications of Moseley's law. [8]