CLASS: M.Sc. PHYSICS **15A / 325**

St. JOSEPH'S COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002

SEMESTER EXAMINATIONS – APRIL 2015

TIME: 2 Hrs. 20 min. **MAXIMUM MARKS: 70**

SEM	SET	PAPER CODE	TITLE OF THE PAPER
II	2014	14PPH2106	ELECTRODYNAMICS AND PLASMA PHYSICS

SECTION – B

Answer all the questions: **5 x 5= 25**

31. a. State and prove divergence theorem.

OR

b. Explain magnetic scalar potential.

32. a. Discuss the solution of wave equation for E and H in uniform plane wave propagation.

OR

b. Explain the propagation of wave in a lossless medium using the concept of Phasor notation.

33. a. Explain the power flow in a concentric cable system using Poynting's theorem.

OR

b. State and prove the boundary condition for the vector $\overline{E}$.

34. a. What are the characteristics of TE and TM waves?

OR

b. What is the Q-factor of wave guides? Explain.

35. a. Explain the principle of detailed equilibrium.

OR

b. What is meant by Mean free path? Explain.

SECTION – C

Answer any THREE questions: 3 x 15 = 45

36. Derive Ampere's law in differential vector form.
37. Derive Maxwell's equation for the vectors D, B, E and H using the standard theorems.
38. State and prove Poynting's theorem.
39. Explain the attenuation characteristics for TE, TM and TEM waves.
40. What are plasma oscillations? Give the experimental evidence for the same.

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