CLASS: IMSc   SEMESTER : VI
BRANCH: Physics   SESSION : SP/2024

SUBJECT: PH315 ELECTROMAGNETIC THEORY

TIME: 3 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Explain how Maxwell generalized the Ampere's circuital law.	[5]	1	5
Q.1(b)	Discuss gauge transformation.	[5]	1	6
Q.2(a)	Prove the transverse nature of electromagnetic wave in unbounded media.	[5]	2	5
Q.2(b)	Discuss the role of refractive index of the medium for propagation of EM wave through dilute plasma or Ionized gas.	[5]	2	6
Q.3(a)	An EM wave polarized perpendicular to the plane of incidence impinges at 30º on a glass slab having refractive index 1.5. Find the amplitude reflection and transmission coefficients.	[5]	3	1
Q.3(b)	Determine the expression for Brewster's angle for s-polarized electromagnetic wave incident at the interface of two media.	[5]	3	5
Q.4(a)	What do you mean by optical rotation and optical activity?	[5]	4	1
Q.4(b)	If the plane of vibration of the incident beam makes an angle of 30º with the optic axis. Compare the intensities of ordinary and extraordinary rays.	[5]	4	2
Q.5(a)	Explain modes in planar guide with suitable figure.	[5]	5	2
Q.5(b)	Develop the expression of group index for the planar wave guide.	[5]	5	3

:::::23/04/2024 M:::::