

2020

Time : 3 hours

Full Marks : 60

*Candidates are required to give their answers in
their own words as far as practicable.*

The figures in the margin indicate full marks.

*Answer any **five** questions in which
Q. No. 1 is compulsory.*

1. Answer any **three** questions of the following :
4×3 = 12
- (a) Distinguish between conduction and displacement current
 - (b) Poynting vector for E. M. Waves
 - (c) Boundary conditions between two media

- (d) Quarter wave plate
 - (e) Biot's laws for Rotatory Polarisation
 - (f) What is Specific Rotation ?
2. Write Maxwell's Equations in E. M. theory. Explain the Physical significance of each of **these** equations giving the basic laws from which **these** are derived. <https://www.jharkhandstudy.com> **12**
3. Obtain expression for velocity of propagation of E. M. wave in free space. Show that the wave is transverse in nature. **8+4 = 12**
4. State and prove Poynting theorem. Explain different terms in value in the theorem. **12**
5. Set up Maxwell's Equation for the propagation of E. M. Waves in conducting medium and explain skin depth. **10+2 = 12**
6. Give the electromagnetic theory of double refraction in uniaxial crystal. **12**
7. Deduce Fresnel's law of reflection and refraction from E. M. theory. **12**

8. Describe Babinet's compensator. Give its theory.
Discuss how elliptically polarised light can be analysed. 12

9 Describe the construction of a Nicol Prism.
How it is used as analyser and polariser.

4+4+4 = 12



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