Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 07

B.Sc. (Computer Science) (2013 & Onwards) (Sem.–2)

THEORY OF RELATIVITY & ELECTROMAGNETISM

Subject Code : BCS-203

M.Code : 71508

Date of Examination : 13-12-22

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and a student has to attempt any FOUR questions.**

SECTION-A

1. Answer briefly :

a) What is relativistic Doppler effect?

b) What is the importance of Minkowski space?

c) A rod 1.0 m long is moving along its length with velocity 0.6c. Calculate the length as it appears to an observer on the surface of earth.

d) Why isolated magnetic poles don't exist?

e) Write down the Maxwell's time dependent equations.

f) What is the importance of Lorentz's force?

g) Show that high frequency electromagnetic waves propagate only a small distance into a conductor.

h) What is displacement current?

i) What is the physical significance of Poynting vector?

j) What is the importance of coupling of electrical circuits?

SECTION-B

2. What do you understand by length contraction and time dilation? Derive the length contraction and time dilation formula using Lorentz transformation equations.

3. Derive the expression for relativistic energy. Show that zero rest mass particles do exist.

4. Write Maxwell's equations in electromagnetic theory. What are the basic laws in physics that these equations illustrate?

5. State and explain Ampere's circuital law. Also discuss its importance and applications.

6. What do you understand by self-inductance and mutual-inductance? State and prove reciprocity theorem. Also discuss its applications.

7. Discuss in detail LCR series and parallel resonant circuits. What are the applications of these circuits?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.