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Total No. of Pages : 02



Subject Code : BCS-203

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

Paper ID : [A2607]

Time: 3 Hrs.

Roll No.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

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Total No. of Questions: 07

- 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) Write the fundamental postulates of Special Theory of relativity.
- b) A rocket is sent with velocity 0.9c. A light pulse is also sent along the same path. What is the velocity of the light pulse relative to the rocket?
- c) Prove that it is not possible for a material particle to have a velocity greater than the velocity of light.
- d) Calculate the velocity of 1 MeV electron.
- e) Calculate the pointing vector for a 100 watt lamp at a distance of 1.0 m from it.
- f) Define the term 'skin depth'.
- g) A current is sent through a hanging coiled spring. What changes do you expect and why?
- h) Define the term 'vector potential'.
- i) Define the term magnetic flux. Give the units in which it is measured.
- j) Why inductance is called electrical inertia?

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SECTION B

- 2. What do you understand by length contraction? On the basis of Lorentz transformation derive an expression for length contraction.
- 3. Derive the formula for relativistic variation of mass with velocity.
- 4. Calculate the impedance of a conducting medium to electromagnetic waves. Name the constants which determine the characteristic impedance of a medium. What is the phase difference between electric and magnetic field vectors?
- 5. Using Biot and Savart's law find the magnetic field due to an infinite straight wire carrying current.
- 6. Explain the phenomena of Hall Effect. How does the Hall Effect decide that current in a metallic conductor is due to negatively charged particles? Derive the value of Hall voltage and Hall coefficient.
- 7. What is mutual induction? Define coefficient of mutual induction between two coils. Give the units in which it is measured.

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