

Seat No.	
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B.Sc. (Part - I) (Semester - II) (CBCS)**Examination, October - 2019****PHYSICS****Electricity and Magnetism-II (Paper - IV) (DSC-2B)****Sub. Code : 72843**

Day and Date : Wednesday, 23- 10 - 2019

Total Marks : 50

Time : 12.00 Noon to 2.00 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Use of scientific calculator is allowed.
 - 4) Draw Neat labeled diagrams wherever necessary.

Q1) Select correct alternative from the following.**[10]**

- a) Faraday's law gives _____ of induced emf
- i) magnitude
 - ii) Direction
 - iii) magnitude and direction
 - iv) unit
- b) Self inductance is measured in _____
- i) ohm
 - ii) farad
 - iii) henry
 - iv) volt
- c) Mathematical formulations of empirical laws in electricity and magnetism are known as _____
- i) Maxwell's equations
 - ii) Faraday's equations
 - iii) Lorentz's equations
 - iv) Newton's equations

P.T.O.

d) The equation of continuity in accordance with the law of conservation of _____

- i) Energy
- ii) Momentum
- iii) Charge
- iv) Mass

e) The SI unit of magnetic induction B is _____

- i) wb/m
- ii) wb/m^2
- iii) m/wb
- iv) wb

f) Divergence of magnetic field is always equal to _____

- i) Zero
- ii) Infinity
- iii) μ_0
- iv) $\mu_0 J$

g) The imaginary number j has value _____

- i) -1
- ii) 1
- iii) $\sqrt{-1}$
- iv) 0

h) At resonance in series L-C-R circuit, the circuit becomes _____

- i) Purely resistive
- ii) Purely inductive
- iii) Purely capacitive
- iv) Purely reactive

i) The curl of magnetic field $\nabla \times B =$ _____

- i) $\mu_0 J$
- ii) Zero
- iii) Infinity
- iv) $\frac{\mu_0}{4\pi}$

- j) In purely resistive circuit the phase of the voltage across resistance or applied a.c.e.m.f. is _____
- | | |
|-----------------------------|--------------------|
| i) Leads by $\frac{\pi}{2}$ | ii) Leads by π |
| iii) In phase | iv) Out of phase |
- k) Susceptibility of paramagnetic substance is _____
- | | |
|-------------|--------------|
| i) Positive | ii) Negative |
| iii) Zero | iv) Infinity |

Q2) Attempt any two of the following : [20]

- a) Obtain an expression for magnetic field at a point on the axis of solenoid of finite length. Hence find magnetic field at a point on the axis of infinite solenoid.
- b) Explain mutual inductance and derive Neumann's formula
- c) State Biot and Savart's law and hence show that $\nabla \cdot B = 0$

Q3) Attempt any FOUR of the following. [20]

- a) Write a note on complex number
- b) Define admittance and susceptance of a.c.circuit
- c) Explain magnetic vector potential
- d) State any five properties of ferromagnetic substance
- e) Write a note on sharpness of resonance
- f) State Maxwell's equations for vacuum and dielectric medium

