PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Third Semester)

Branch – **PHYSICS**

ELECTRICITY AND MAGNETISM

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Find the force acting between two charges is _____.
(i) directly Proportional to the distance
(ii) inversely proportional to the distance
(iii) directly proportional to the square of the distance
(iv) inversely proportional to the square of the distance

2 According to ohm's law, the P.D between the ends of a conductor is proportional to
(i) Current (ii) Voltage
(iii) distance (iv) distance^2

3 According to Faraday's first law of electrolysis, the amount of any substance deposited at the electrode is directly proportional to the quantity of _____.
(i) Voltage drop (ii) Resistance
(iii) Electricity passed (iv) Tolerance

4 Identify the Quality factor Q of a coil is
(i) $\omega L/R$ (ii) ωLR
(iii) $R/\omega L$ (iv) $L/\omega LR$

5 The susceptibility is independent of temperature in which materials?
(i) Paramagnetic (ii) Ferromagnetic
(iii)Diamagnetic (iv) Antiferrimagnetic

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Explain the electric potential.
OR
b Derive the relation between D,E and P.

7 a Describe the current density.
OR
b State Kirchhoff's law.

8 a State Faraday's Law of electrolysis
OR
b Outline the peltier coefficient.

9 a Produce the RMS Value in AC Circuit.
OR
b Discuss the decay constant.

Cont...

10 a Derive the relation between magnetic susceptibility and permeability.

OR

b Explain the Ampere's circuital law and its applications.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a State and Prove Gauss Law and mention its applications.

OR

b Derive an expression for the potential as line integral of electric field.

12 a Derive the expression on Drude- Lorentz theory of electrical conduction.

OR

b Explain with necessary theory how a Carey Foster bridge may be used to compare two nearly equal resistances? Hence show how the specific resistance can be measured with a Carey Foster bridge?

13 a Differentiate the ionic mobilities from theoretical and experimental methods.

OR

b State Thomson effect and derive the expression of Thomson coefficient.

14 a Elucidate the concept of LCR circuits in Series resonance circuit.

OR

b Discuss the growth of charge in a circuit containing C and R.

15 a Discuss the properties of Para, dia and ferro magnetic materials

OR

b Outline the Langevin theory of diamagnetic materials.

Z-Z-Z END