PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Third Semester)

Branch – **PHYSICS**

ELECTRICITY & MAGNETISM

Time: Three Hours Maximum: 50 Marks

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

1. According to Gauss's law, the electric field due to an infinitely long thin charged wire varies as:
   (i) 1/r (ii) 1/(r*r)
   (iii) r (iv) r*r

2 The equation $\sum e = \sum IR$ is applicable to which law?
   (i) Kirchhoff's second law (ii) Kirchhoff's junction rule
   (iii) Kirchhoff's third law (iv) Newton's Law

3 _____ describes current flow between two junctions formed by two different metals.
   (i) Peltier effect (ii) Thomson effect
   (iii) Seebeck effect (iv) Both (ii) &(iii)

4 Resonance frequency occurs when _____?
   (i) $X_L = X_C$ (ii) $X_L > X_C$
   (iii) $X_L < X_C$ (iv) $X_L = 0$

5 Which of the following conditions are desired in the core of an electromagnet?
   (i) High permeability and High retentivity
   (ii) Low permeability and High retentivity
   (iii) High permeability and Low retentivity
   (iv) Low permeability and Low retentivity

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

6 a Obtain the relation between electric field and electric potential.
OR
b Deduce Gauss law for dielectric medium.

7 a Obtain the equation of continuity.
OR
b Describe the working of Carey Foster bridge.

8 a Outline the Faraday laws of electrolysis.
OR
b Explain : Peltier effect.

9 a Discuss the series resonance circuit.
OR
b Discuss the growth of current in LR circuit.

10 a Explain Langevin's theory of diamagnetism.
OR
b Enumerate Ampere's circuital law.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

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

11 a Explain Gauss law with any one application.

OR

b Define the relation between Dielectric Constant and Polarization.

12 a State and Explain Kirchoff's rules.

OR

b Explain the working of potentiometer.

13 a Elucidate the laws of thermoelectricity.

OR

b Explain : Thomson effect.

14 a Describe the parallel resonance circuit.

OR

b Elucidate the decay of current in CR circuit.

15 a Describe the domain theory of ferromagnetism.

OR

b Obtain Maxwell's equations.

Z-Z-Z END