PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2018
(Third Semester)

Branch - PHYSICS

ELECTRICITY AND MAGNETISM

Time : Three Hours   Maximum : 75 Marks
SECTION-A (20 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (1 0 x 2 = 20)

1   Write Poisson's equation and Laplace equation and explain the terms.
2   Define the term Polarization of dielectric.
3   Give the equation of Continuity.
4   State Norton's theorem.
5   State seebeck effect of thermoelectricity .
6   State Thomson's effect.
7   Give the expressions for the average value and RMS value of alternating current.
8   What is meant by power factor and give the expression for power factor of
     an ac circuit containing resistance, inductance and capautance.
9   Write Maxivell's equations of electromagnetism.
10   Define the term magnetic susceptibility and magnetic permeability.

SECTION - B (25 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 5 = 25)

11 a Deduce the relation between electric field and electric potential.
                          OR
    b Explain Gauss's law for dielectric medium.

12 a State and explain Kirchoffs laws of electricity.
                          OR
    b Give the principle of Potentiometer.

13 a State Faraday's laws of electrolysis. Describe in detail the determination
        of ionic mobilities.
                          OR
    b State and explain laws of thermo emf.

14 a   Explain j-operator method in the study of A.C Circuits.
                          OR
    b Discuss the growth of current in RC Circuit.

15 a State and explain Ampere's Circuital law.
                          OR
    b Give an account of domain theory of ferromagnetism.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16   State and explain Gauss's law of electrostatics and also derive an
        expression of differential form of Gauss's Law.
17   Discuss in detail Drude-Lorentz theory of electrical conductivity.
18   State and explain pettier effect and discuss the applications of
        thermodynamics.
19   Give the principles of Transformer. Discuss in detail the construction and
        theory of transformer.