

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)  
**BSc DEGREE EXAMINATION MAY 2017**  
(Third Semester)

14PH008

Branch- **PHYSICS****ELECTRICITY & MEGNETISM**

•Time : Three Hours

' Maximum : 75 Marks

**SECTION-A (20 Marks!)**Answer **ALL** questions**ALL** questions carry **EQUAL** marks (10x2 = 20)

- 1 Define dielectric constant.
- 2 Write the relation between susceptibility and dielectric constant...
- 3 State Ohm's law.
- 4 Define current density.
- 5 Define peltier coefficient.
- 6 Define ionic velocities and motilities.
7. Define power factor.
- 8 Define the efficiency of a transformer.,
- 9 State Ampere's circuital law. ~
- 10 Define magnetic susceptibility and magnetic permeability.

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

- 1 1 a i) State Gauss divergence theorem.  
ii) Derive the differential form of Gauss law. . (2+3)  
OR
- b State and derive potential as line integral of electric field. (2+3)
- 12 a Derive the equation of continuity.  
OR  
b Discuss briefly superposition theorem.
- 13 a State and prove Faraday's laws of electrolysis.  
OR  
b Explain i) • Peltifer effect ii) Therrftoemf iii)thermoelectricity  
iv) Thomson effect v) Thomson coefficient
- 14 a Derive an expression for the discharge of a capacitor through an inductance.  
OR \*  
b Discuss construction and working of a transformer.
- 15 a Briefly differentiate Dia, para and ferro magnetic materials. †  
OR  
b What is ferro magnetism? Explain the hysteresis curve on the basis of domain.

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

- 16 State Gauss law. Discuss any two applications of Gauss law. (2+4+4)
- 17 Describe with necessary theory how casey Foster bridge may be used to measure very low resistance

- 18 Prove the thermoelectric relation i)  $\alpha = T \cdot \frac{dE}{dT}$  ii)  $G = T \frac{d^2E}{dT^2}$
- 19 A source of an alternating emf is connected to a series combination of a resistor R an inductor L and a capacitor C . Obtain with the help of a vector diagram and impedance diagram. Find an expression for i) effective voltage, ii) the impedance iii) the phase relationship between current and the voltage.
- 20 Derive Maxwell's equations.

Z-Z-Z

END