Mid Semester (First Semester) Exam-2018, Subject: Physics-1(Introduction to Electromagnetic Theory

Mechanical Engineering/Production Engineering/Mining Engineering

Answer from all the Groups as Directed   Full Marks-20   Time-1 ½ hours

Group –A

(Multiple- Choice Type Questions)

(Compulsary)

1.Answer any Four questions for the following:

$$1*4=4$$

I. What is the process of producing electric dipoles inside the dielectric by an external electric field?
a) Polarisation
b) Dipole moment
c) Susceptibility
d) Magnetisation

II. Which of the following easily adapt itself to store electrical energy?
a) Passive dielectric
b) Superconductor
c) Active dielectric
d) Polar molecules

III. How does ionic polarisation occur?
a) Splitting of ions
b) Passing magnetic field
c) Displacement of cations and anions
d) Never occurs

IV. When does a dielectric become a conductor?
a) At avalanche breakdown
b) At high temperature
c) At dielectric breakdown
d) In the presence of magnetic field

V. Potential difference is the work done in moving a unit positive charge from one point to another in an electric field. State True/False.
a)True
b)False

VI.Gauss law cannot be expressed in which of the following forms?
a)Differential
b)Integral
c)Point
d)Stokes theorem

BIT Sindri
1" Mid-term examination – 2018
Semester 1 (First year)
Branch – Chemical Engineering
Physics 1
(... Physics)

Group-B
(Long-answer Type Questions)
Answer any Four Questions:

1. Discuss Gauss's Law in integral form and conversion to differential form. 04

2. (a) Define the terms 'Electric intensity' and Electrical displacement density.

    (b) Derive Poisson's and Laplaces 's equation from fundamentals. 04

3. Discuss energy associated with a charge distribution and derive the expression for the

    energy stored in a Capacitor in terms of charge and capacitance. 04

4. Define the term potential and establish the gradient relationship between potential and

    Electric field intensity. 04

5. Explain the phenomenon of polarization when a dielectric slab is subjected to an

    electric field .How this phenomenon reduces the electric field inside the dielectric. 04

6. What is the dielectric polarization? .Establish the relation of $D=\epsilon_0 E+P$. 04