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BIEE-005

01980

B.Tech. VIEP - ELECTRICAL ENGINEERING - III

Term-End Examination

December, 2010

BIEE-005 : ELECTROMAGNETIC THEORY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any seven questions.*

1. Explain the law of force between charged particles (Coulomb's law). **10**

2. A charge + Q is located at A (−a, 0, 0) and another −2Q is located at B (a, 0, 0). Show that the neutral point also lies on the $x-$ axis where $x = -5.83a$. **10**

3. Discuss pressure on the surface of charged conductions and pressure on boundary surfaces of two dielectrics. **10**

4. (a) Find the potential inside a hollow cylindrical ring. **5+5=10**

   (b) Electric field within a charged hollow sphere.

5. Eight identical drops of mercury charged at 12 V above earth's potential are made to coalesce into a single mercury drop. What is the new potential and how has the internal energy of the system changed ? **10**

6. Give the analogy between Electric current and Electric flux. **10**

7. State Maxwell's equations for free space and prove that they are satisfied by **10**

$$E=\frac{\partial A}{\partial t} \text{ and } B=\text{curl } A$$

provided div $A=0$ and $\nabla^2 A=\frac{1}{C^2}\frac{\partial^2 A}{\partial t^2}$

8. What is Smith's chart ? What is it used for ? **10**

9. Discuss transmission lines with negligible losses (i.e. loss less lines) **10**

10. Write a short notes on **any two** of the following : **5+5=10**
    (a) Biot-Savarts law
    (b) Snell's law of refraction
    (c) B-H curve of a magnetic specimen