

Code: EE1T6

**I B.Tech - I Semester – Regular / Supplementary Examinations
November 2017**

**INTRODUCTION TO ELECTRICAL ENGINEERING
(ELECTRICAL AND ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

1.

- a) Define Kirchhoff's voltage law.
- b) Demonstrate the differences between EMF and potential difference.
- c) Define the following
(i) Power (ii) Work (iii) Energy.
- d) What is Electrical Energy? How Electrical Energy is different from mechanical energy.
- e) Define coulomb's law and Write expression for coulomb's law.
- f) Explain the capacitance of a parallel plate capacitor in uniform medium.
- g) Describe the relationship between B and H and draw BH curve.
- h) Write short note on series inductances.
- i) Explain the characteristics of Lead acid cell.

- j) Describe the advantages of three phase AC over single phase AC.
- k) Define Faraday's laws of Electromagnetic induction.

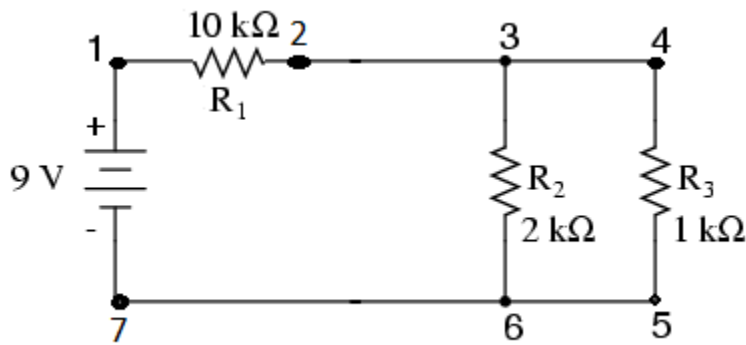
PART – B

Answer any **THREE** questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2.a) Demonstrate the effect of temperature on resistance. 8 M

b) Find the voltage drop across R₁, R₂ and R₃ shown in figure below. 8 M



3.a) Write SI units for Power, Work and Energy and obtain relationship between Thermal, mechanical & electrical units. 8 M

b) An Electrical kettle contains 2 kg of water at 25⁰C. It takes 2 hours to raise the temperature to 100⁰C. Assume the heat losses due to radiation and heating the kettle to be 15Kcal, find (i) Wattage of Kettle

(ii) current taken if supply voltage is 230V. 8 M

- 4.a) Define the following: 8 M
- (i) Electric Field Strength
 - (ii) Electric Flux Density
 - (iii) Electric Potential
 - (iv) Potential Gradient
- b) Derive the equation for equivalent capacitance of two capacitors C_1 , C_2 connected in series. Find the equivalent capacitance of three capacitors with capacitance $4 \mu\text{F}$, $6 \mu\text{F}$, $8 \mu\text{F}$ connected in series. 8 M
- 5.a) Explain about the following 8 M
- (i) Magnetic hysteresis
 - (ii) Dynamically Induced EMF and Statically Induced EMF
- b) Derive the expression for equivalent inductance of two inductors connected in series. Consider mutual inductance between two coils. 8 M
- 6.a) Explain about the construction of Nickel Iron Cell with neat sketch. 8 M
- b) Write short note on the following
- (i) Principle of DC Machine. 4 M
 - (ii) Advantages of AC over DC. 4 M