

Code: EE1T6

**I B.Tech - I Semester – Regular / Supplementary Examinations
November 2018**

**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 Electric current? Explain different types of Electric Current?
- b) Define the following
 - i) Electric Potential
 - ii) Potential Difference
- c) Write the units for Electrical Energy and Thermal Energy?
- d) Define Power? Derive the expression for Power?
- e) Write the Properties of Electric lines of force?
- f) Define Electric flux density? Derive the relation between Electric flux density and Electric intensity?
- g) Define the following
 - i) Magneto Motive Force
 - ii) Reluctance
 - iii) Permeance
- h) Mention comparison between Magnetic and Electric circuits?
- i) Explain different types of Cells?

j) Mention the conditions to generate alternating Voltage?

k) Define the following:

i) Waveform

ii) Instantaneous Value

iii) Cycle

iv) Time Period

PART – B

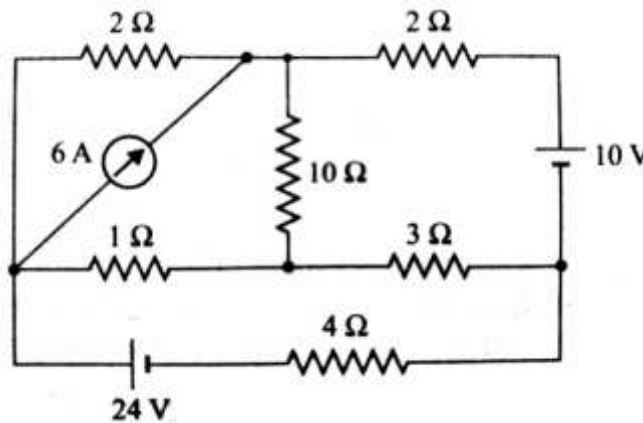
Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) State and explain Kirchhoff's Laws.

8 M

b) Determine the current in 4Ω resistance in the circuit. 8 M



3. a) Explain heating effect of electric current. Obtain the relationship between thermal, electrical and mechanical units.

6 M

b) An electrically driven pump lifts 80m^3 of water per minute through a height of 12m, allowing an overall efficiency of 70% for the motor and pump, calculate the input power to motor. If the pump is in operation for an average of 2hours per day for 30 days. Calculate energy consumption in kWh and the cost of energy at the rate of 50 Paise per kWh. Assume 1m^3 of water has a mass of 1000 kg and $g=9.81\text{m/s}^2$ 10 M

4. a) If three equal capacitors are connected in i) series and ii) parallel then find the ratio between the equivalent capacitance for both the series and parallel connections. 8 M

b) Three Capacitors of capacitance $2\mu\text{F}$, $4\mu\text{F}$ and $6\mu\text{F}$ respectively are connected in series to a 220V D.C. supply. Find i) the total capacitance ii) Charge on each capacitor and iii) Voltage across each capacitor 8 M

5. a) Define Magnetic Flux density and magnetic field strength. Write a short notes on B-H curve and its importance. 8 M

b) An iron ring of cross-sectional area 6cm^2 is wound with a wire of 100 turns and has a saw cut of 2mm. Calculate the magnetizing current required to produce a magnetic flux of 0.1mWb if mean length of magnetic path is 30cm and relative permeability of iron is 470. 8 M

6. a) What are the Characteristics of a Lead-acid Cell and Write the Indications of a fully charged Lead-acid cell. 10 M

b) A Lead-Acid cell is charged at the rate of 18A for 10 hours at an average voltage of 2.26Volts. It is discharged in the same time at the rate of 17.2A, the average voltage during discharge being 1.98volts. Calculate
i) ampere-Hour efficiency ii) watt-hour efficiency.

6 M