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**B.Tech. (Sem. - 1<sup>st</sup> / 2<sup>nd</sup>)**

**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

**SUBJECT CODE : EE - 101 (2K4 & Onwards)**

**Paper ID : [A0117]**

[Note : Please fill subject code and paper ID on OMR]

**Time : 03 Hours**

**Maximum Marks : 60**

**Instruction to Candidates:**

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Five** questions from Section - B & C.
- 3) Select atleast **Two** questions from Section - B & C.

**Section - A**

**Q1)**

**(Marks : 2 each)**

- a) Define Average value of a sinusoidal wave.
- b) What is leakage coefficient? Give its effect in magnetic circuit.
- c) Which dc motor is used for traction purpose and why?
- d) Differentiate between squirrel cage & slip ring induction motor.
- e) State working principle of induction type instruments.
- f) Define Hall's effect and give its applications.
- g) Draw turn off characteristics of thyristor.
- h) State salient features of zener diode.
- i) Convert the decimal number 39.75 to octal.
- j) What is XOR gate? Draw its truth table.

### Section - B

(Marks : 8 each)

- Q2) (a) How does the resistance of metals and semiconductors vary with temperature? What is the significance of a negative temperature coefficient?
- (b) State and explain Kirchoff's laws.
- Q3) (a) Discuss various characteristics of a series RLC resonant circuit. Derive mathematical expressions in support of your discussion.
- (b) A series circuit consists of a  $115\ \Omega$  resistor, a  $0.024\ \mu\text{F}$  capacitor and coil of inductance  $L$ . If the resonant frequency of the circuit is  $1000\ \text{Hz}$ , determine inductance and bandwidth.
- Q4) (a) Define the coefficient of inductance. Obtain an expression for the force between two parallel conductors carrying currents.
- (b) With the help of a neat diagram discuss various parts of dc machine.
- Q5) Describe with constructional details the principle and working of a moving coil permanent magnet type ammeter. What type of control and damping are used in this instrument? Draw neat sketches to illustrate your answer.

### Section - C

(Marks : 8 each)

- Q6) (a) Define gauge factor. Explain why semiconductor strain gauges have high values for the gauge factor.
- (b) Discuss the working principle, frequency response and applications of piezoelectric transducers.
- Q7) (a) Discuss the operation of n-channel JFET and plot its drain characteristics. Define pinch off voltage.
- (b) Briefly compare the turn on methods of thyristors.
- Q8) (a) What is importance of integrated circuit? Classify the different types of IC's.
- (b) What is the need of voltage regulator in a power supply? Discuss the applications of voltage regulator IC 7805.
- Q9) (a) What are the Universal gates? Why are they so called?
- (b) What is JK flip flop? Discuss its working. What is race around condition?

