B.Tech. (Sem. - 1st/2nd)

BASIC ELECTRICAL AND 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) The resistance of two wires is 25Ω when connected in series and 4Ω when connected in parallel. Calculate the resistance of each wire.

b) Determine the average and rms values of sinusoidal current of peak value 40A.

c) Explain the working principle of a D.C shunt generator.

d) List various parts of a squirrel cage induction Motor.

e) What is the function of moving disc in a single phase induction type energy meter.

f) Explain why moving coil permanent magnets are not used for ac measurements.

g) What is a piezoelectric transducer?

h) Draw the voltage-current characteristics of an SCR.

i) What are linear ICS?

j) Draw the truth table of a J-K flip flop.

Section - B

(Marks: 8 Each)

Q2) (a) Define temperature coefficient of resistance? Why is its knowledge important?

(b) Two heaters A and B are in parallel across the supply voltage V. Heater A produces 500 kilo calories in 20 minutes and B produces 1000 kilo calories in 10 minutes. If the resistance of A is 10Ω, what is the resistance of B? How much heat will be produced in 5 minutes, if the heaters are connected in series.

Q3) A circuit of resistance 15Ω and inductive reactance 12Ω is connected in parallel with another circuit consisting of a resistor of 25Ω in series with a capacitor of reactance 17Ω. The combination is energised from a 200V, 50 Hz supply. Find the branch currents, total currents and power factor of the combination.

Q4) (a) Define self inductance and mutual inductance. Derive an expression between self inductance of two coils, mutual inductance between them and coefficient of coupling.

(b) Explain the working principle of a transformer and draw a sketch showing parts of a core type transformer.

Q5) With the help of neat diagrams explain the construction and working of repulsion type of moving iron instrument. Enumerate its advantages and disadvantages.

Section - C

(Marks: 8 Each)

Q6) (a) Explain the working of a Linear Variable differential transformer.

(b) What is a thermocouple? Where are thermocouples used practically?

Q7) (a) What are field effect transistors? Explain the differences between JFET and MOSFET.

(b) Explain the working of a full bridge rectifier.

Q8) (a) Draw the pin diagram of IC78 XX and explain the connections of each Pin.

(b) What is IC 555 used for? Give its Pin diagram.

Q9) (a) Convert the decimal number 150 into its equivalent binary, hexadecimal and octal number.

(b) What is a flip-flop? What is meant by a clocked flip-flop? Why S = R = 1 condition not permitted in a S-R flip-flop?