

Roll No.

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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.

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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?

