PAPER ID—10703

B. Tech. EXAMINATION, 2024

(Second Semester)

ELECTRONICS AND COMPUTER ENGINEERING

Code : EEE-101

Basics of Electrical and Electronics Engineering

Time : 3 *Hours* *Maximum Marks :* 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all. Q. No. 1 (Unit I) is compulsory. All questions carry equal marks.

Unit I

1. (a) Define electrical power and electrical energy with their unit.

   (b) What are independent and dependent sources ?

   (c) Draw and explain impedance triangle.

   (d) What is resonance in an electric circuit ?

   (e) What is the difference between clipping and clamping a circuit ?

   (f) Compare *n*-channel and *p*-channel MOSFET.

   (g) Define the amplification factor in JFET.

7×2=14

Unit II

2. (a) Derive expressions for converting star circuit to delta circuit. 7

   (b) State and explain KVL and KCL with their significance. 7

3. (a) State and explain nodal method of analysis. 7

(b) A resistance of 4 Ω is connected in series with a combination of 12 Ω and 24 Ω in parallel. The whole circuit is connected across 120 volts supply. Find (i) the current taken from the supply. (ii) voltage across 4 Ω resistance. (iii) current flowing through 12 Ω and 24 Ω resistance. 7

4. (a) Define the following : 7

(i) Average value

(ii) RMS value

(iii) Peak value

(iv) Instantaneous value.

(b) A coil of resistance 20 Ω and inductance 100 mH is connected in series with a capacitance of 400 μF across 100 V, 50 Hz AC supply.

Calculate

(i) magnitude of current

(ii) phase angle

(iii) power factor

(iii) voltage across each element. 7

5. (a) Describe the working of a *p-n* junction diode and draw and explain V-I characteristics of it. 7

(b) Draw and explain the circuit diagram of half wave and full wave rectifier. 7

6. (a) Draw drain and transfer characteristics of JFET. 7

(b) Explain Transconductance (g_m) parameter of JFET. 7

7. (a) Draw the circuit diagram of MOSFET and discuss its configuration when it is used as switch. 7

(b) Explain *three* regions of operation of a MOSFET. 7