7. Explain construction and operation of BJT and discuss its biasing methods and input and output characteristics of CE, CB and CC configurations. **14**

Unit IV

8. Explain the important parameters of a JFET and derive their relationship. Also explain small signal model of a JFET and its frequency limitations. **14**

9. Explain small signal model of a MOSFET and its applications in electronic circuits. Also explain structure and working of a MOS capacitor and its significance in MOSFET operation. **14**

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(T) Roll No. .....

PAPER ID—10703

B. Tech. EXAMINATION, 2026

(Second Semester)

COMPUTER SCIENCE AND ENGINEERING (ARTIFICIAL INTELLIGENCE)

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, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks. Assume any missing data appropriately.

1. (a) Define electric charge with its unit.

(b) What is a series circuit ? Write formula for equivalent resistance.

(c) What is Capacitor ? Define capacitance with its unit.

(d) Define power factor and mention its types.

(e) What is resonance in an AC circuit ? Mention conditions for resonance.

(f) What is DC load line in a transistor circuit ?

(g) What are main terminals of a JFET ?

7×2=14

Unit I

2. What are Current sources ? Differentiate them with suitable diagrams and characteristics. **14**

3. State and explain Thevenin and Norton theorems. **14**

Unit II

4. Explain the representation of sinusoidal waveforms. Define instantaneous value, peak value, average value and RMS value of an alternating quantity. **14**

5. Explain complex power, real power, reactive power and apparent power in AC circuits. Present the relationship between real power, reactive power and apparent power by a power triangle. **14**

Unit III

6. Explain half-wave and full-wave rectifiers with suitable circuit diagrams and waveforms. Compare their working, efficiency, ripple factor and practical applications. **14**