(T) Roll No. .....

PAPER ID—10703

B.Tech. Computer Science and Engineering (Internet of Things and Cyber Technology Including Block Chain technology), Bachelor of Technology (Computer Science and Engineering), Bachelor of Technology in Electronics Engineering (VLSI Design Technology)

EXAMINATION, 2025

(Second Semester)

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 any *four* questions from Unit II. Q. No. 1 (Unit I) is compulsory. All questions carry equal marks.

Unit I

1. (a) What are the active and passive elements of an electric circuit ?

   (b) State and explain Ohm's law.

   (c) What is meant by complex power ?

   (d) Define power factor and its significance.

   (e) Draw the V-I characteristics of a practical *p-n* diode.

   (f) Write a note on MOS capacitance.

   (g) What is pinch off voltage. ? **7×2=14**

Unit II

2. (a) State and explain superposition theorem and mention its applications. 7

(b) Three resistances of 3, 4 and 5 Ω are connected in parallel and this combination is put with 2 Ω resistor. Find (i) Total equivalent resistance of whole combination, (ii) Current supplied by the battery having a capacity of 10 V with its internal resistance of 0.1 Ω. 7

3. (a) Explain the conversion of current source into equivalent voltage source for solving a problem. 7

(b) State and explain mesh method of analysis. 7

4. (a) An inductive coil having a resistance of 15 Ω takes a current of 4 A, when connected to a 100 V, 60 Hz supply. If the coil connected to a 100 V, 50 Hz supply. Calculate (i) current, (ii) power, (iii) power factor. 7

(b) What is polyphase system ? Discuss the advantages of 3-phase over 1-phase system. 7

5. (a) What is *p-n* junction diode ? Explain its forward mode of operation. 7

(b) Write notes on the following : 7

(i) Varactor diode

(ii) Voltage regulator.

6. (a) Give the expression for transistor power dissipation and switching time. 7

(b) Draw drain and transfer characteristics of JFET. 7

7. (a) What are the various types of amplifiers ? Describe amplification factor in a transistor. 7

(b) Draw the symbol and discuss basic structure and main feature of MOSFET. 7

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