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BEY–012

BACHELOR OF SCIENCE (APPLIED SCIENCE–ENERGY) (BSCAEY)

Term-End Examination

December, 2025

BEY-012 : ELECTRICAL AND ELECTRONICS SCIENCE

Time : 3 Hours *Maximum Marks : 70*

***Note** : (i) Attempt any **five** questions.*

(ii) All questions carry equal marks.

1. (a) Discuss the concept of electrical power and energy. Write the mathematical expressions and explain their practical significance. 7

   (b) Compare and contrast active power, reactive power and apparent power in AC circuits. Derive their mathematical relationships. 7

2. (a) Explain construction and working principle of a single phase transformer with a neat diagram. 7

   (b) Derive the EMF equation of a transformer. 7

3. (a) Explain the construction and working principle of a DC generator. 7

   (b) Derive the EMF equation of a DC generator. 7

4. (a) Compare squirrel cage and slipring induction motor in terms of construction, operation and application. 7

   (b) Draw and explain V-I characteristics of PN junction diode. Also, write down the expression for diode current. 7

5. (a) Draw and explain the input and output characteristics of BJT in Common Emitter (CE) configuration. 7

   (b) Describe the construction and working of a MOSFET in enhancement mode. 7

6. Explain the following with circuit diagram and truth table : 7+7=14

   (i) JK Master slave slip flop

   (ii) Clocked D-flip flop

7. Write short notes on any *two* of the following : 2×7=14

   (a) Linear Variable Differential Transformer (LVDT)

   (b) Unijunction Transistor (UJT)

   (c) Biot-Savart's Law and its applications

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