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BEY–012

BACHELOR OF SCIENCE (APPLIED SCIENCE–ENERGY (BSCAEY)

Term-End Examination

June, 2025

BEY-012 : ELECTRICAL AND ELECTRONICS SCIENCES

Time : 3 Hours *Maximum Marks : 70*

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

(ii) All questions carry equal marks.

1. (a) State and explain Kirchhoff's voltage and current law. 7

   (b) Deduce analogy between magnetic circuit and electric circuit. What are the major points of difference between them ? 7

2. (a) Explain the phenomenon of resonance in RLC circuit. 7

   (b) Explain the construction and working principle of single phase transformer. 7

3. (a) The armature of a 8-pole d.c. generator has 960 conductors and runs at 400 r.p.m. The flux per pole in 40 MWb.

   (i) Calculate the induced e.m.f., if the armature in lap wound.

   (ii) At what speed should it be driven to generate 400 V, if the armature were wave-connected ? 7

Or

What is the basic principle of DC generator ? Write the necessary conditions for voltage builtup in a shunt generator. 7

   (b) Explain constructional features of synchronous generators. What is synchronous speed ? 7

4. (a) Explain the V-I characteristics of Zener diode and explain its working as a voltage regulator. 7

Or

Explain diode applications as rectifiers.

(b) Describe the characteristics of a transistor in CE configuration. 7

5. (a) What is the difference between Ordinary algebra and Boolean algebra ? 7

(b) Explain the characteristics of SCR and TRIAC. 7

6. (a) Describe functional elements of a generalized measuring system. 7

(b) State various electrical transducers with its applications. What are the advantages of electrical transducers ? 7

7. Write short notes on any *four* of the following : $4 \times 3\frac{1}{3} = 14$

(a) Construction of Lead Acid Battery

(b) Energy stored in charged capacitor and inductor

(c) Equivalent circuit of an ideal transformer

(d) Single phase induction motor

(e) Classification of material based on energy band theory

(f) Active and reactive power

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