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BEY–012

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

Term-End Examination

December, 2024

BEY-012 : ELECTRICAL AND ELECTRONICS SCIENCES

Time : 3 Hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. All questions carry equal marks.*

1. (a) Mention various advantages of electrical energy over other types of energy. 7

   (b) State and explain Faraday's law of electromagnetic induction. 7

2. (a) Write the phasor diagram for the following combination when the circuits are excited by single phase AC supply : 7

   (i) R-C series combination

   (ii) AC through pure inductive circuit

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(b) Explain the principle of operation of transformer. Draw phasor diagram of transformer on no load. 7

3. (a) The armature of 6 pole d.c. machine 0.75 metre in diameter has 664 conductors, each having an effective length of 0.30 metre and carrying a current of 100 A. If 70% of total conductors lie simultaneously in the field of average flux density of 0.85 Wb/m^2, calculate the armature torque developed. 7

Or

Describe different interconnections and categories of DC machines.

(b) Give the principle of operation (or working principle) of 3-phase induction motor. 7

4. (a) Explain and draw V-I relation of a diode. 7

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

5. (a) Discuss 'NOT' and 'NOR' operations using a suitable diagram. Draw the truth table for three input 'AND' operation. 7

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(b) Explain the principle of operation of Silicon Controlled Rectifier (SCR) and draw its V-I characteristic. 7

6. (a) What is Transducer ? Give classification of transducers. 7

(b) With the help of a block diagram, explain the functional elements of a generalised measuring system. 7

7. Write short notes on any ***four*** of the following :

$4 \times 3\frac{1}{2} = 14$

(a) Electrical Instruments—Ammeter and voltmeter

(b) Care and maintenance of Lead Acid Battery

(c) Iron losses or core losses of transformer

(d) Single-phase induction motor

(e) Construction of a junction transistor

(f) D and T flip-flop

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