H.T.No. | | | | | | | | | | |

Code No: EE1505 **GEC-R14**

II B. Tech I Semester Regular Examinations, November 2016

ELECTRICAL TECHNOLOGY

(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Give classification of DC motors?
2. Write the EMF equation of transformer and explain each term in it.
3. Write the equations for starting and full load torque equations of three phase induction motor.
4. List out any two applications of AC servomotor.
5. Explain different types of alternators.
6. What is different damping arrangements used in measuring instruments?

PART-B

4 × 12 = 48M

1. a) Why is starter necessary for a DC motor. (2M)
   b) Explain the working of a 3-point starter with a circuit diagram for a DC shunt motor. (5M)
   c) A 230V shunt motor has an armature resistance of 0.2Ω. The starting armature current must not exceed 50A. If the numbers of sections are 5, calculate the values of resistance steps to be used in the starter. (5M)
2. a) Obtain the equivalent circuit of a single-phase transformer. Explain how to evaluate the equivalent circuit of a transformer from open circuit and short circuit tests. (6M)
   b) A 5 kVA, 220 / 110 volts, 1-phase transformer has a maximum efficiency of 96.97 % at 0.8 p.f. lagging. It has a core loss of 50 watts and the full load regulation at 0.8 p.f. lagging is 5 %. Find the efficiency and regulation at full load 0.9 p.f. lagging. (6M)
3. a) Explain why the rotor of polyphase induction motor can never attain synchronous speed. (4M)

b) A 10 kW, 400 V, 3-phase, 4-pole, 50 Hz delta connected induction motor is running at no load with a line current of 8 A and an input power of 660 watts. At full load, the line current is 18 A and the input power is 11.20 kW. Stator effective resistance per phase is 1.2 Ω and friction, windage loss is 420 watts. For negligible rotor ohmic losses at no load, calculate,

i) stator core loss; ii) total rotor losses at full load;

iii) total rotor ohmic losses at full load; (iv) full load speed;

v) internal torque, shaft torque and motor efficiency. (8M)

4. a) What is a stepper motor? List its advantages. (6M)

b) With neat sketch, explain the working principle of shaded - pole single - phase Induction Motor. (6M)

5. a) Define voltage regulation of an alternator. Explain synchronous impedance method of determining regulation of an alternator. (6M)

b) Calculate the voltage induced per phase in a 3 phase 50 Hz, alternator having a flux per pole of 0.1515 wb. The no. of conductors in series are 360. Assume full pitch coil with a distribution factor of 0.96. (6M)

6. a) With a neat sketch explain in detail moving iron repulsion type instrument. (9M)

b) Give the importance of damping torque in measuring instruments. (3M)

*****