**Code No: EE1505**                                                 **GEC-R14**

**II B. Tech I Semester Supplementary Examinations, January 2017**

# 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. List out the different losses in a DC generators

2. Write the expressions for $R_{01}$ and $R_{02}$ in a single phase transformer.

3. Can the rotor catch the speed of flux in an induction motor? Explain in short.

4. Draw the circuit diagram for split phase induction motor.

5. Define pitch factor and distribution factor.

6. List out the different damping mechanisms of the measuring instruments.

## PART-B

                                                          **4 × 12 = 48M**

1. a) Explain speed Vs current, speed Vs torque and armature torque and armature current characteristic of dc shunt motor. (6M)

   b) A DC Motor takes an armature current of 110 Amps at 480V. The armature circuit resistance is 0.2 ohm. The Machine has 6 Poles and armature is lap connected with 864 conductors. The flux per pole is

     0.05 Wb. Calculate (6M)

     i) Speed                              ii) Gross Torque developed by armature.

2. a) A 6300/210, 50Hz, single phase transformer has per turn emf of about 9 volts and maximum flux density of 1.2 T. Find the number of high voltage and low voltage turns and net cross sectional area of the core. (6M)

   b) Obtain the expression for the EMF equation of transformer. (6M)

3. a) Draw and explain the slip-torque characteristics of a induction motor.

                                                              (6M)

   b) A 3-Phase, 500V, 50HZ induction motor with 6 poles gives an output of 20kw at 950 rpm with a p.f of 0.8. The mechanical losses are equal to 1kw. Calculate for this load (6M)

     i) Slip                                                 ii)

Rotor copper losses

iii) Input, if the stator losses are 1500 watts      iv) Line current

4. a) With neat diagram explain in detail about AC servo motors. (6M)

   b) Discuss in detail about stepper motors and write is applications. (6M)

5. a) Discuss in detail about synchronous impedance method for the determination of regulation. (6M)

   b) A 3 Phase, star connected alternator supplies a load of 10MW at a pf of 0.85 lagging and at 11KV (terminal Voltage), Its resistance is 0.1 ohm per phase and synchronous reactance of 0.66 ohm per phase. Calculate the line value of EMF generated. (6M)

6. a) Discuss in detail about the following (i) Control Mechanism (ii) Damping Mechanism. (6M)

   b) With neat diagram explain Moving Iron Attraction instrument. (6M)

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