

Code No: RT21045

R13**SET - 1****II B. Tech I Semester Supplementary Examinations, Oct/Nov- 2017****ELECTRICAL TECHNOLOGY**

(Com. to ECE, EIE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **THREE** Questions from **Part-B****PART-A**

1. a) Discuss the principles of electromechanical energy conversion.
b) What are the functions of brushes in a DC generator?
c) Draw the speed-torque characteristics of DC series, shunt and compound motors.
d) Draw the equivalent circuit of a transformer.
e) Define slip and synchronous speed in induction motor.
f) Write the expressions for hysteresis and eddy current losses.
g) What is the double field revolving theory (3M+3M+4M+3M+3M+3M+3M)

PART-B

2. With the help of neat diagram obtain the expression for the energy stored in a magnetic system for a simple attracted armature type relay. Explain the operation of system.
3. a) Draw and explain the load characteristics of DC series and shunt generators.
b) Derive e.m.f equation for a DC machine.
4. a) What are the different speed control methods of DC Shunt motor? Explain each method and enumerate advantages and disadvantages.
b) A 220V shunt motor takes 60A when running at 800 rpm. It has an armature resistance of 0.1 ohms. Determine the speed and armature current if the magnetic flux weakened by 20%. Contact drop/brush is 1 V.
5. a) Explain the principle of operation of transformer under no load and loaded conditions at different power factors.
b) In no load test on a 1-phase transformer the following test data were obtained:
i) Primary voltage=220V; ii) Secondary voltage=110 V; iii) Primary current=0.5 A;
iv) Power input=30 Watts; v) Resistance of primary winding = 0.6 ohms
Calculate (i) turns ratio (ii) magnetizing component of no load current (iii) working component of no load current (iv) iron loss.
6. a) Explain the different starting methods of 3-phase induction motor.
b) A slip ring induction motor runs at 290 rpm on full load when connected to a 50Hz supply. Calculate (i) number of poles, (ii) slip, (iii) slip for full load torque if the total resistance of the rotor circuit is doubled.
7. a) Explain the construction and working principle of shaded pole motor. Also draw its characteristics.
b) Explain the construction and principle of operation of single phase induction motor and their applications.