

Code No: RT21045

R13**SET - 1****II B. Tech I Semester Supplementary Examinations, May/June - 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) What are the differences between singly excited and doubly excited systems?
b) What is the principle used in a DC generator.
c) What are different types of losses in a DC motor.
d) Draw the phasor diagram of transformer under no-load condition.
e) What are the differences between slip ring and squirrel cage induction motors?
f) Draw the speed torque characteristic of a shaded pole motor.
g) Why core of a transformer is laminated. (3M+3M+4M+3M+3M+3M+3M)

PART-B

2. a) Explain the mechanical energy and work done in singly excited system when actual displacement occurs?
b) Explain the principle of energy conversion of electromechanical system.
3. a) Classify the DC machine based on excitation systems. Explain with relevant diagrams.
b) A 440V DC shunt generator has an armature resistance of 0.25 ohms and the resistance of the shunt field is 220 ohms while delivering a load current of 50A. If has a terminal voltage of 440V, determine the generated e.m.f and power developed?
4. a) With neat diagram explain the Swinburne's test conducted on DC shunt motors. What are the advantages and limitations of this test? Enumerate all calculations.
b) A DC series motor is driving a fan load, whose torque varies a cube of speed. The total armature and series field resistance is 1 ohm. It takes 10 A from 200 V mains and runs at 1000 rpm. Find the resistance to be connected in series with the motor to make it run at 800 rpm.
5. a) Explain the constructional features of a single phase transformer and further classify the transformers based on design.
b) A 7.5 kVA, 2400V/120V transformer was tested by short circuiting the low voltage side and applying 100 V to the high voltage side. The measured power input was 145 W. Determine the regulation when the load has 0.8 lagging power factor.
6. a) A 3-phase, 4-pole delta connected Induction Motor has a full-load slip of 5%, if the supply frequency is 50 Hz. Find the full-load speed, synchronous speed and frequency of rotor e.m.f.
b) Derive the expression for torque-slip characteristics of a 3-phase Induction Motor. Explain how the torque of Induction Motor varies with speed with the help of a diagram.
7. Explain the constructional features and principle operation of a single phase induction motor.