

Code: EC3T5

**II B.Tech - I Semester – Regular Examinations - January 2014**

**ELECTRICAL TECHNOLOGY  
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Marks: 5X14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Explain the construction details of D.C generators with neat sketches. 7 M
  
- b) A shunt generator supplies 75 A at 200 V through feeders of resistance 0.08  $\Omega$ . The armature and shunt field windings have resistance of 0.04  $\Omega$  and 80  $\Omega$  respectively. Find terminal voltage and generated E.M.F. 7 M
  
2. a) What is the necessity of starter in D.C. Motor? Describe the principle of operation 3-point starter with neat sketch. 7 M
  
- b) A 10 KW ,250V ,D.C shunt Motor with an armature resistance of 0.8  $\Omega$  and field resistance of 275  $\Omega$  takes 3.91A, when running light at rated voltage and rated speed.
  - i) What conclusions can you draw from the above data regarding machine losses?
  - ii) Calculate the machine efficiency as a generator when delivering an output of 10kw at rated voltage and speed and as a Motor drawing an input of 10kw. neglect stray losses. 7 M

3. a) What is a transformer? Explain its principle of operation. 7 M
- b) Draw and explain the phasor diagram of practical transformer with resistance and leakage reactance under
- i) lagging load
  - ii) leading load 7 M
4. a) In a 25 kVA, 2000/200 V transformer, the iron and copper losses are 300 and 400W respectively.
- i) Calculate the efficiency on unity power-factor at full load and half full load.
  - ii) Determine the load for maximum efficiency and iron and copper losses in this case. 7 M
- b) Write a short notes on short circuit test on transformer 7 M
5. a) Explain the principle of operation of 3-phase induction motor with flux and MMF waves. 7 M
- b) Derive the conditions for maximum starting and running torques of 3-phase induction motor and also draw Torque-slip characteristics. 7 M
6. a) Derive the EMF equation of an Alternator. And also define pitch factor and distribution factor. 7 M

b) How can you determine the synchronous reactance of alternator by synchronous impedance method. 7 M

7. Write a short notes on following

i) stepper motor

ii) capacitor motors 14 M

8. a) Discuss the principle of operation of PMMC instruments and also derive its torque equation. 7 M

b) Write short notes on solar photo voltaic energy. 7 M