Code: R7210405

**R7**

B.Tech II Year I Semester (R07) Supplementary Examinations, May 2013

**ELECTRICAL TECHNOLOGY**
**(Common to ECE, EIE, E.Con.E and ECC)**

Time: 3 hours                                                                                                  Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1  (a)   Explain in detail the construction of a DC generator.
   (b)   An 8-pole lap wound generator rotating at 350 rpm to generate 260 V. The flux per pole is 0.05
         wb. Calculate the number of conductors per slot if the armature has 120 slots.

2  (a)   With a neat diagram, explain the working of a three point starter?
   (b)   A 230 V D.C. shunt motor takes 32 A at full load. Find the back EMF on full load if the resistances
         of motor armature and shunt field windings are 0.2 ohms and 115 ohms respectively.

3  (a)   Draw and explain the no load phasor diagram for a single phase transformer.
   (b)   A single-phase transformer has 400 primary and 1000 secondary turns. The net cross sectional
         area of the core is 60 $cm^2$. If the primary winding is connected to a 50 Hz supply at 500 V.
         Calculate:
         (i) The voltage induced in the secondary winding and (ii) Peak value of flux density in the core.

4        Discuss the procedure for conducting OC and SC tests on a single phase transformer with neat
         sketches. How can the parameters are found from these tests?

5  (a)   Explain the construction and working of a 3-phase squirrel case induction motor.
   (b)   A 3-phase alternator having 12-poles is driven at a speed of 500 rpm. It supplies power to an 8-
         pole, 3 phase induction motor. If the slip at full load is 4%. Calculate the full load speed of the
         motor.

6  (a)   Derive EMF equation of alternator and explain coil span factor and distribution factor.
   (b)   A 3 phase, star connected alternator is rated at 1600 KVA, 13500 V. The armature resistance and
         synchronous reactance are 1.5 ohm and 30 ohms respectively per phase. Calculate the
         regulation for a load of 1280 KW at 0.8 pf lead.

7  (a)   Describe the construction and operation of a shaded pole motor.
   (b)   Explain the differences between AC and DC series motors.

8        Explain the types of forces that are needed for the operation of indicating instrument.

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