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B.E / B.Tech ( Full Time ) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013

ELECTRONICS AND COMMUNICATION ENGINEERING

Third Semester (III)

EE 9215- Electrical Engineering  
(Regulation 2008)

16

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. What is the role of interpole in a DC machine?
2. State the condition for the maximum efficiency of a DC generator.
3. Define the regulation of the transformer
4. Draw the Phasor diagrams of a transformer for unity power factor.
5. The full load slip of a 50Hz , 12 pole squirrel cage induction motor is 5%. What is its full load speed?
6. How the direction of rotation of a three phase induction is reversed?
7. Define synchronous speed.
8. Draw the V-curve and mention its significance.
9. Compare over head and under ground electric power transmission system.
10. List the different types of tariff.

**Part – B ( 5 x 16 = 80 marks)**

11. (i) Draw a scheme for power factor improvement and discuss it in detail (8)  
(ii) Write a technical note on Interconnected Grid system. (8)
12. a) A 8 kW ,220-V Dc shunt motor draws a line current of 5.6A, while running at a no-load speed of 1000 rpm. It has an armature resistance of 0.30 ohm and a field resistance of 150 ohm. Estimate the efficiency of the motor when it delivers rated load.

OR

- b) A 440-V shunt generator has a full-load current of 250A, its armature resistance is 0.08 ohm and field resistance is 150 ohm, the stray losses are 2800 W. Find the horse power of the prime mover when it is delivering full load and also find the load for which the efficiency of the generator is maximum.
13. a) A 10 kVA, 415/230 V, single phase , 50 Hz transformer has maximum efficiency of 93 % at 81 percentage of full load and UPF. Determine the efficiency at 0.8 power factor lagging.

OR

- b) (i) Draw and explain the equivalent circuit diagram of a single phase transformer with referred to primary. (8)  
(ii) Prove an autotransformer requires less volume of copper compared with a double wound transformer for the same output and voltage ratio. (8)

14. a) Explain the construction and working principles of three phase squirrel cage induction motor with neat diagrams

OR

- b) Why single phase induction motor is not a self starting one? List the different starting mechanism of single phase induction motor and explain any two in detail with necessary diagrams.
15. a) A 1500 KVA, 3500 V, 50 Hz three phase, star connected synchronous generator has an armature resistance of 0.2 ohm per phase. A field current of 50 A produces a short circuit current of 262 A and an open circuit EMF of 1200 V between lines. Calculate voltage regulation of the generator on full load at 0.8 power factor lagging

OR

- b) (i) Derive the EMF and torque equations for a Synchronous machine. (12)  
(ii) Write a short note on synchronous condensers (4)