Code No: R1621355 **R16** SET - 1

II B. Tech I Semester Regular Examinations, October/November - 2017
ELECTRICAL SYSTEMS
(Agricultural Engineering)

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 **FOUR** Questions from **Part-B**

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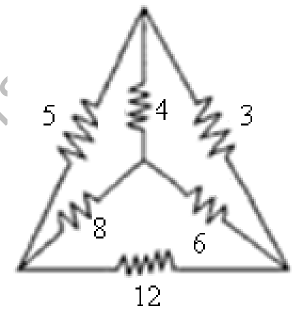
PART –A

1\. a) States the Kirchoff's laws (2M)
b) How transformers transfer electrical energy from one circuit to another? (2M)
c) Derive the condition for maximum efficiency of a transformer (3M)
d) What is the basic principle of DC motor (2M)
e) What are the benefits of power factor improvement (2M)
f) What is the working principle of three phase induction motor – (3M)

PART -B

2\. a) State and explain the Superposition theorem (8M)
b) Reduce the network as shown in following figure into an equivalent star connected resistance and delta connected resistance. All the resistances are in ohms (6M)



3\. a) Explain the working principle of a single phase transformer. (7M)
b) A 50 kVA, single phase transformer has 500 turns on the primary and 200 turns on the secondary. The primary is connected to 2000V, 50 Hz Supply. Determine i) The secondary voltage and ii) The maximum value of flux. (7M)

4\. a) Draw and explain the no load phasor diagram for a single phase transformer? (7M)
b) An 8-pole DC shunt generator with 600 wave connected armature conductors an running at 800rpm supplies a load of 8 ohms resistance at a terminal voltage of 230V. The armature resistance is 0.28ohms and field resistance is 200 ohms, find (7M)
i) Armature current, ii) Induced emf and iii) Flux per pole
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5. a) Explain the EMF commutation method for DC machines. (7M)

   b) A D.C series motor operates at 1000 r.p.m with a line current of 50 A from 220V mains. Its armature circuit resistance is 0.05 ohm and its field resistance is 0.1 ohm. Find the speed at which the motor runs at a line current of 25 A assuming the flux at this current is 45 % of flux at 50 A. (7M)

6. a) Explain the flux control and armature control of shunt motors. (7M)

   b) Describe the split phase induction motor with necessary characteristics. (7M)

7. What are the speed control methods used for induction motors? Discuss them briefly (14M)