Code No: RT21356 **R13** SET - 1

II B. Tech I Semester Supplementary Examinations, May/June - 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 **THREE** Questions from **Part-B**

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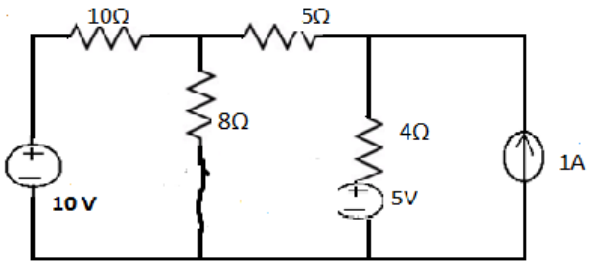
PART –A

1. a) What is the maximum power transferred to a load resistance R. R is parallel with 14 Ω resistance, both of them in series with 12 Ω resistance and 100 V source. (4M)
   b) What is meant by dielectric insulation? (4M)
   c) Define efficiency of transformer. What are the main factors causing low efficiency? (4M)
   d) Which types of d.c generators are suitable to provide constant voltage profile? (3M)
   e) List different methods for the speed control of DC motors? (4M)
   f) Define slip of three phase induction motor. (4M)

PART –B

2. a) Using nodal analysis, find the current and voltage across the 8 Ω resistance. (8M)



   b) For a series resonance circuit, obtain the expression for bandwidth in terms of resonance frequency. (8M)
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3. a) A magnetic circuit comprising a teroid with 500 turns, cross sectional area of 6 cm^2 and mean radius of 15 cm carries a coil current of 4A. Find (i) the total ampere-turns (ii) reluctance of the magnetic circuit (iii) the total flux enclosed (8M)
   b) Deduce the emf equation of transformer. Briefly describe its importance. (8M)

4. a) Explain the working of transformer under loaded condition. Draw the phasor diagram when load power factor is leading. (8M)
   b) An 8-pole armature rotated at 350 r.p.m and it is required to generate 260 V. The useful flux per pole is 0.05 wb. If the armature has 120 slots, what are the numbers of conductors per slot? If the armature rotates at 500 r.p.m what is the induced e.m.f? (8M)

5. a) What are the different commutation techniques in a d.c. machine? Explain them in brief. (8M)
   b) How the torques is developed in a dc motor and deduces its expression? (8M)

6. a) Explain double field revolving theory of single phase induction motor. (8M)
   b) Give the constructional details and working principle of shaded pole induction motor? (8M)

7. a) Explain the usage of current transformer and voltage transformer. Give their constructional details. (8M)
   b) Explain various speed control methods of three phase induction motor. (8M)