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

II B. Tech I Semester Supplementary Examinations, October/November - 2018
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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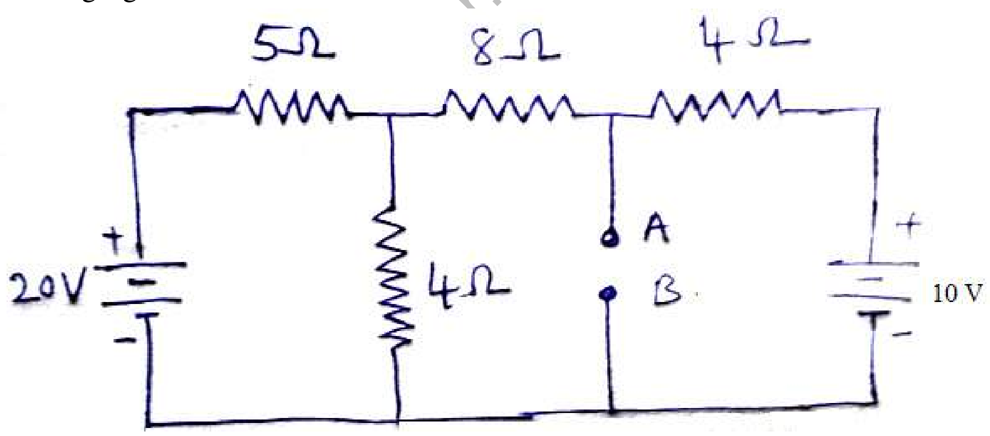
PART –A

1. a) An electric heater draws 1000 W from 250 V source. What is power it takes from 230 V source? What is the value of heater resistance? (4M)
   b) What is dielectric strength and how is its constant defined? (4M)
   c) What is the demagnetizing ampere turns in the armature reaction? (3M)
   d) What is the difference between armature torque and shaft torque produced in dc motor? (4M)
   e) What are the factors controlling the speed of the dc motor? Express them. (4M)
   f) Why the rotor windings are short circuited in three phase induction motor? (3M)

PART -B

2. a) Obtain the Thevenins equivalent circuit at A and B of the circuit shown in the following figure. (8M)



   b) Explain how the Laplace transform method can be applied to find the responses of d.c. RL and RC series circuits. (8M)

3. a) A magnetic circuit composed of silicon steel has square construction having inner dimension of square 30 cm and outer dimension of square 40 cm. The third dimension is 10 cm. It has electric coil on one limb only, find mmf required to produce a core flux of 2.5 mWb. How much current must be made through the coil if it as 80 turns? (8M)
   b) What are the constructional features of sell type transformer? How is it different from core type transformer? (8M)
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4. a) A single phase 250/500V transformer gave the following test results (8M)
   Open circuit test : 250 V, 80 W, 1 A on LV side
   Short circuit test : 20 V, 100 W, 12 A on HV side
   Calculate the equivalent circuit parameters
   b) What is armature reaction in dc machine? How it is reduced? (8M)

5. a) Draw and explain load characteristics dc shunt generator. (6M)
   b) The armature of a 4-pole, 220 V, d.c. shunt motor is having lap winding. There are 120 slots, each slot containing 8 conductors. The flux per pole is 20 mWb and current taken by the motor is 25 A. The resistance of armature and field windings are 0.1 and 110 Ω respectively. If the rotational losses are 810 W Calculate (10M)
   i) torque developed ii) shaft torque and iii) efficiency

6. a) Explain how we can implement flux control and armature rheostat control methods of speed control for a typical d.c. shunt motor. Enumerate the differences in the two method? (8M)
   b) Draw and explain equivalent circuit of single phase induction motor without neglecting core loss. (8M)

7. a) In the two watt meter method,show that the total power measured by the two watt meters is equal to total power of the three phase circuit. (8M)
   b) Draw the schematic diagram of D.O.L starter and explain its operation. (8M)