

Code No: R1621355

R16**SET - 1****II B. Tech I Semester Supplementary Examinations, May - 2019****ELECTRICAL SYSTEMS**

(Agricultural Engineering)

Time: 3 hours

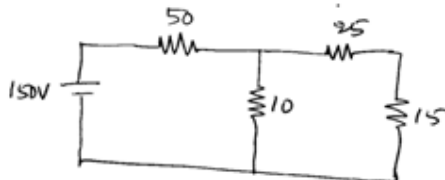
Max. Marks: 70

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****PART -A**

1. a) State Superposition theorem (2M)
- b) Define electromotive force and reluctance (2M)
- c) What is the working principle of DC generator (3M)
- d) What are the effects of commutation in DC machine (2M)
- e) What is the principle of operation of single phase induction motor (3M)
- f) What are the merits and demerits of Star -delta starter (2M)

PART -B

2. a) State and explain Kirchoff's 's laws (7M)
- b) Calculate the magnitude and direction of current in the 10 ohms resistor. As shown in following figure that the power delivered by source is equal to power dissipated in the resistors. (All resistance is in ohms). (7M)



3. a) Explain the core and shell type transformers with diagrams (7M)
- b) The transformation ratio in single phase 50 Hz transformer is 11000/400V. If the maximum value of flux in the core is to be about 0.05 Wb, determine the number of turns in each winding. (7M)
4. a) Develop an expression for induce emf in a DC machine from first principles and what is the basic nature of the induce emf in a DC generator? (7M)
- b) In no load test of single phase transformer, the following test data was obtained: (7M)
Primary Voltage : 220V, Secondary Voltage : 110V
Primary current: 0.5 A, Power input: 30W.
Resistance of the primary winding = 0.6 ohm
Find the following:
i) Turns ratio, ii) magnetizing component, iii) working component and
iv) iron loss component

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5. a) Derive the torque equation for a D.C motor. (7M)
- b) A 250V, DC shunt motor takes a line current of 20A resistance of shunt field winding is 200 ohms and resistance of the armature is 0.3ohms. Find the armature current and the back emf. (7M)
6. a) Describe the equivalent circuit of single phase induction motor without core loss and with core loss (8M)
- b) Define the power factor? Explain its importance. (6M)
7. a) Explain how do you determine the power factor using two watt meter method with diagram. (7M)
- b) Describe the production of rotation field in three phase induction motor (7M)