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

**II B. Tech I Semester Regular/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 **FOUR** Questions from **Part-B**

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## PART –A

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| 1. | a) | State Norton's theorem | (2M) |
| | b) | What is the working principle of transformer. | (2M) |
| | c) | Derive the EMF equation of DC generator | (3M) |
| | d) | What is the working principle of DC motor- | (3M) |
| | e) | What are the factors controlling the speed in DC motors | (2M) |
| | f) | What are the speed control methods used for induction motor | (2M) |

## PART -B

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| 2. | a) | Define the terms<br>i) Cycle<br>ii) Amplitude<br>iii) R.M.S value and<br>iv) Average value of an alternating quantity. | (8M) |
| | b) | Three resistance R, 2R and 3R are connected in delta. Calculate the resistances for equivalent star connection. | (6M) |
| 3. | a) | What are the difference between shell and core type transformer | (7M) |
| | b) | A single phase transformer with a ratio of 440/110V takes on no load current of 4A at 0.3 p.f lagging. If the secondary supplies a current of 60A at 0.85 p.f lagging, estimate the current taken by primary. | (7M) |
| 4. | a) | Briefly discuss the armature reaction in DC machines | (6M) |
| | b) | The readings obtained from tests on 20 kVA, 2200/220V, 50Hz transformer are<br>O.C. Test (LV Side) : 220V,4.2A, 148W<br>S.C. Test (HV Side): 86V,10.5A,360W<br>Determine the efficiency at full load and half the full load at 0.8 power factor lagging. | (8M) |
| 5. | a) | Draw and explain the no-load magnetization characteristics of a separately excite generator? | (7M) |
| | b) | A 220V motor has an armature circuit resistance of 0.1Ω. If the full load armature current is 20A and the no load armature current is 5A. Find the change in back e.m.f from no-load to full-load. | (7M) |
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6. a) What are the effects of low power factor (7M)
   b) Explain the shaded pole type single phase induction motor with necessary diagrams (7M)

7. a) Describe the measurement of power in three phase system using single watt meter method with neat diagram (7M)
   b) Explain the starting of induction motor using autotransformer (7M)