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

II B. Tech I Semester Supplementary Examinations, Oct/Nov - 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) Define the statement of superposition theorem and mention any one applications (4M)

b) Describe about reluctance and mention its units. (3M)

c) Write about commentator? (4M)

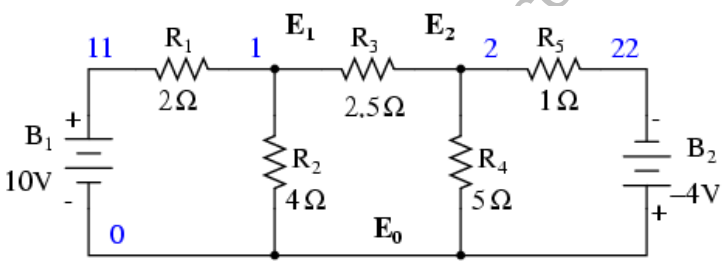
d) Briefly discuss about resistance commutation? (3M)

e) Write the disadvantages of low power factor. (4M)

f) How the speed is controlled by adding an external resistance in the rotor circuit. (4M)

PART -B

2 a) Calculate node voltages for the below circuit using nodal analysis. (8M)



b) A series RLC circuit with R=120Ω, L=0.08H & C=50μF has an applied voltage of 65V with variable frequency. Calculate resonance frequency, current at resonance, voltage across R, L & C, upper and lower half frequencies, bandwidth, Q-factor of the circuit (8M)

3 a) Discuss in detail about working principle of a single phase transformer. (8M)

b) Derive the expression for coefficient of coupling between two mutually coupled coils. (8M)

4 a) Discuss any one method in detail to improve commutation. (8M)

b) Explain in detail about various losses and derive condition for maximum efficiency for a dc machine. (8M)
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5	a)	Discuss in detail about working principal and construction of DC motor.	(8M)
	b)	A 4 pole d.c. shunt generator with a wave wound armature has to supply a load of 500 lamps each of 150W at 230V. Allowing 12V for the voltage drop in the connecting leads between the generator & the load and drop of 1V per brush, calculate the speed at which the generator should be driven. The flux per pole is 35mwb and the armature and shunt field resistances are respectively 0.09Ω and 55Ω.	(8M)
6	a)	Discuss in detail about principle of operation of induction motor.	(8M)
	b)	Explain in detail about double field revolving theory.	(8M)
7	a)	Derive torque equation of a 3-phase induction motor.	(8M)
	b)	Describe in detail about production of rotating magnetic field of an induction motor.	(8M)