Code No. 6066 / M

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/CSE) II – Semester (Main) Examination, June 2014

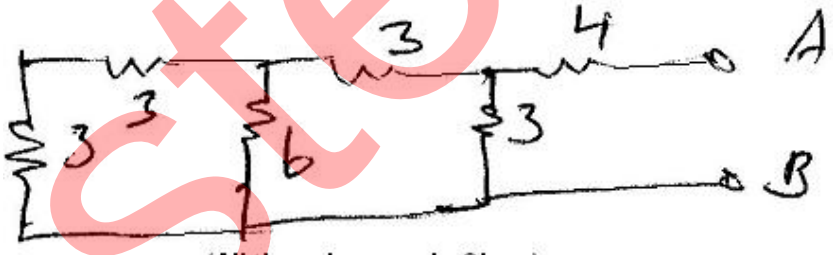
Subject: Electrical Circuits & Machines

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

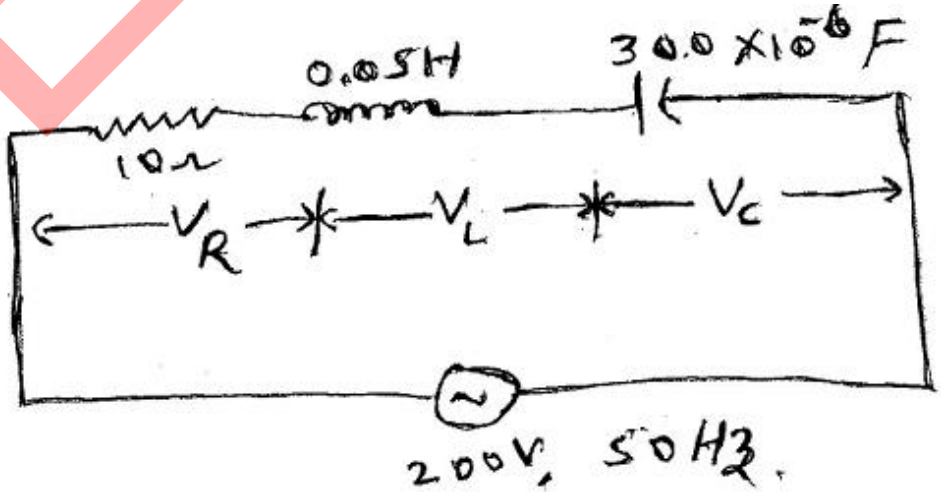
1	State, explain Kirchoff's current law.	3
2	Write expressions for active and reactive power.	2
3	Explain how power is transformed from one circuit to another circuit in a 1-phase transformer.	3
4	What do you understand by balanced 3-phase circuits?	2
5	What are the conditions for self excitation in a D.C. shunt generator.	3
6	What do you understand by critical resistance in DC machine?	2
7	Draw speed-torque characteristics of an 3-phase insulation motor.	3
8	Give reason why 3-phase induction motor cannot run at synchronous speed.	2
9	Why 1-phase induction motor are not self starting.	2
10	Calculate equivalent resistance between terminals A and B for the circuit shown below:	



(All the values are in Ohms)

PART – B (50 Marks)

11.



For the circuit shown above calculate Impedance, current, p-f, V_L, V_R, V_C, active power and reactive power. Also draw vector diagram. 10

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12 State and explain the following theorems
a) Norton's theorem b) Thevanin's theorem.

13 (a) Prove that V = $\sqrt{3}\, V_{Ph}$ in 3-phase star connection. 5
(b) The power in a 3-phase circuit is measured by two wattmeters. If the input power is 100 kW and p.f. is 0.66 lagging. What will be the reading of each wattmeter? 5

14 Explain in detail O.C and S.C. tests of a single-phase transformer with neat circuit diagrams. Also explain how equivalent parameters and efficiency can be evaluated by these tests. 10

15 Explain in detail constructional details and principle operation of D.C. generator. Also derive the emf equation of a D.C. machine. 10

16 (a) Explain low production of rotating magnetic field is produced in 3-phase induction motor. 5
(b) Explain any one method of starting of 3-phase induction motor with neat schematic diagram. 5

17 (a) Explain capacitor run motor with help of neat circuit diagram and mention its application. 5
(b) Explain constructional details and working principle of stepper motor. 5

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