

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)

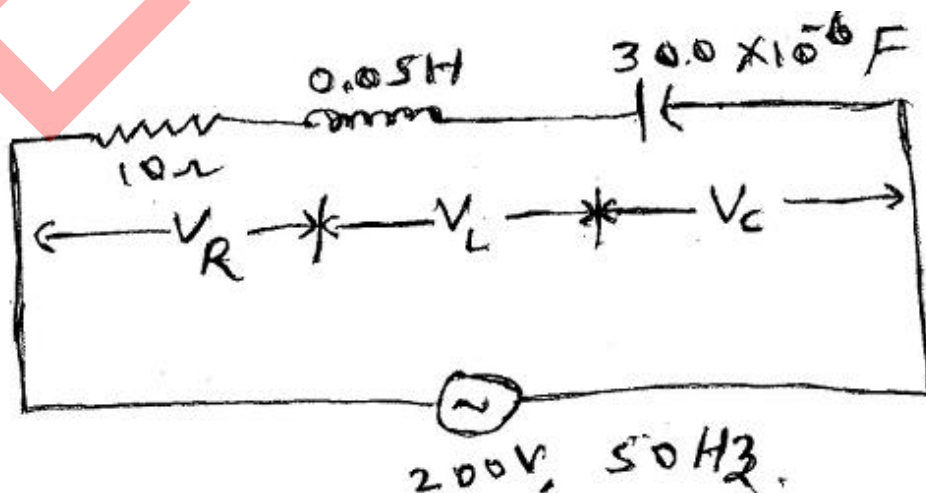
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| 1 | State, explain Kirchoff's current law. | 3 |
| 2 | Write expressions for active and reactive power. | 2 |
| 3 | Explain how power is transformed from one circuit to another circuit in a 1-phase transformer. | 3 |
| 4 | What do you understand 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 induction 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

.....2.

- 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 how 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
