Hall Ticket Number:

Code No. : 7213

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. I Year (EEE) II-Semester (Main) Examinations, July-2016
(Power Systems & Power Electronics)
Machine Modelling and Analysis

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2=20 Marks)

1. Draw the diagram of an elementary 2-pole dc machine.

2. Draw the equivalent circuit of a compounded DC Machine.

3. What are the differences between permanent magnet dc machine and shunt connected dc machine?

4. What is Kron's transformation?

5. Derive a transformation that yields only constants when $\omega = \omega_e$ for a balanced three phase set with a phase sequence of acb.

6. Explain about various reference frames.

7. Draw the winding arrangement of elementary two pole, two phase and symmetrical induction machine.

8. Derive the relationship that can be used to convert a per unit impedance from one VA base to another.

9. Is it possible to apply change of variables to rotor variables of salient pole synchronous machine? Explain.

10. What do you mean by time varying inductance?

Part-B (5 × 10=50 Marks)
(All bits carry equal marks)

11. a) Discuss the energy relations in an electromechanical system.

　　b) How do you evaluate the total energy stored in the coupling field for a singly excited system?

12. a) How would you develop the mathematical model of DC shunt machine?

　　b) Draw the Time domain block diagram of DC shunt machine using State variable equations.

13. a) With necessary equations draw arbitrary reference frame equivalent circuit for three phase resistive elements

　　b) With necessary equations draw arbitrary reference frame equivalent circuit for three phase inductive elements.

14. a) Obtain the voltage equations of induction machine in arbitrary reference frame variables in terms of flux linkages.

　　b) Develop the equivalent circuit diagram of an induction machine using voltage equations in arbitrary reference frame variables.

15. a) Obtain the stator voltage equations of three phase Synchronous machine in Arbitrary Reference frame Variables.

    b) Develop the equivalent circuit diagram of three phase Synchronous machine in Arbitrary Reference frame Variables.

16. a) Derive the torque equation of a Kron's primitive machine.

    b) Explain the steady state analysis of a DC Series motor.

17. Write short notes on any **two** of the following:

    a) Transformation between reference frames.

    b) Arbitrary reference frame.

    c) Dynamic performance of Induction machine.

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