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Total Number of Pages : 01

M.TECH

AR-19

M.TECH 1<sup>ST</sup> SEMESTER EXAMINATIONS NOV/DEC 2019

PE, MPCPE1020

MODELLING AND ANALYSIS OF ELECTRICAL MACHINES

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A

(10 X 2=20 MARKS)

1. Answer the following questions.

- What is the necessity for predetermination of voltage regulation?
- Name the various methods for predetermining the voltage regulation of 3-phase Alternator.
- How synchronous impedance is calculated from OCC and SCC?
- What are the advantages and disadvantages of estimating the voltage regulation of an Alternator by EMF method?
- Why is the MMF method of estimating the voltage regulation considered as the optimistic method?
- How does change in excitation affects the load sharing?
- What steps are to be taken before disconnecting one Alternator from parallel operation?
- What is meant by infinite bus-bars?
- How does increase in excitation of the Alternator connected to infinite bus-bars affect this operation?
- What are the advantages of cage motor?

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

- (a) What controls the terminal voltage of an induction generator operating alone?  
(b) What conditions are necessary for paralleling two synchronous generators?
- (a) What is an infinite bus? What constraints does it impose on a generator paralleled with it?  
(b) Why is overheating such a serious matter for a generator?
- (a) Why is the efficiency of an induction motor (wound-rotor or cage) so poor at high?  
(b) What are starting code factors? What do they say about the starting current of an induction motor?
- (a) What information is learned in a locked-rotor test?  
(b) What information is learned in a no-load test?
- (a) What actions are taken to improve the efficiency of modern high-efficiency induction Motors?  
(b) Explain just how the synchronous impedance and armature resistance can be determined in a synchronous generator.
- (a) Why is terminal voltage speed control limited in operating range?  
(b) What is the difference between a permanent-magnet type of stepper motor and a Reluctance-type stepper motor?
- (a) What mechanisms produce the starting torque in a hysteresis motor?  
(b) What mechanism produces the synchronous torque in a hysteresis motor?

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