

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV (New) EXAMINATION – WINTER 2015

Subject Code: 2140906

Date: 28/12/2015

Subject Name: AC Machines

Time: 2:30pm to 5:00pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Derive the equation of electromagnetic torque for a three phase induction motor with usual notations from first principles. **07**
- (b)** Describe the effect of armature reaction in case of a synchronous generator. **07**
- Q.2 (a)** Draw the phasor diagram (vector diagram) for a three phase induction motor and justify the statement 'Power factor of the motor improves from no load to full load'. **07**
- (b)** Derive the emf equation of an alternator. Just define the pitch factor and distribution factor. **07**
- OR**
- (b)** Explain the construction of a salient pole synchronous machine. **07**
- Q.3 (a)** Discuss the procedure to perform no load and blocked rotor tests on a three phase induction motor. **07**
- (b)** Mention the types of starters for a three phase induction motor. Explain DOL starter in detail. **07**
- OR**
- Q.3 (a)** Explain the procedure to construct the circle diagram of induction motor. Also describe the method to determine losses, efficiency and slip at full load condition using circle diagram. **07**
- (b)** Briefly explain the double field revolving theory in relation to single phase AC motors. **07**
- Q.4 (a)** List the methods of determination of voltage regulation of an alternator. Describe any one of them in detail. **07**
- (b)** Write a short note on auto synchronous motor. **07**
- OR**
- Q.4 (a)** Explain with reason why synchronous motor is not self starting. Discuss the methods of starting the synchronous motor. **07**
- (b)** What is synchronization? Explain two bright one dark lamp method of synchronization. **07**
- Q.5 (a)** Draw the schematic diagram and explain the principle of induction generator. **07**
- (b)** Explain the construction and working of universal motor. **07**
- OR**
- Q.5 (a)** Briefly describe the construction and working of linear induction motor. **07**
- (b)** Mention the types of single phase AC motors. Explain the construction and working of shaded pole single phase motor. **07**
