

(03 Hours)

Total marks:80

- N.B.:-** (1) Question No.1 is compulsory.
(2) **Attempt** any **three** questions out of remaining **five** questions.
(3) Assume suitable data if necessary and justify the same.

Q.1 Solve any four

- a. Explain various losses taking place in a single-phase transformer **05M**
- b. List out the advantages, Disadvantages and applications of autotransformer **05M**
- c. Explain connection and phasor diagram of yy0 transformer. **05M**
- d. Explain the applications of single-phase induction motor. **05M**
- e. Describe torque-speed characteristics of a three phase IM in braking, motoring and generating regions. **05M**

Q.2. Answer the following questions.

- a. Explain the need of starter in three phase IM. Describe Direct On Line (DOL) starter in Detail. **10M**
- b. Explain the power stages with neat labeled diagram and expression in three phase IM. **10M**

Q.3 Answer the following questions.

- a. Explain saving of cu in auto transformer. **10M**
- b. Describe the V - connection with diagram. **10M**

Q.4. Answer the following questions.

- a. Explain construction, working of capacitor start Single phase Induction Motor. **10M**
- b. An 18.64 KW, 4 pole 50 Hz 3-phase induction motor has friction and windage losses of 2.5 % of output. The full load slip is 4%. Find for full load (i) rotor Cu loss (ii) the rotor input (iii) the shaft torque. (iv) the gross electromagnetic torque.

Q.5. Answer the following questions.

- a. Discuss the necessary conditions required for parallel operation of three phase transformers, **10M**
- b. A 200 kVA, 2000/440 V, 50 Hz single-phase transformer gave the following test results: **10M**
O.C. test: 2000 V, 1.8 A, 175 kWon H.V. side
S.C. test: 13 V, 300 A, 1kw on L.V. side
Obtain the equivalent circuit parameters as referred to H.V. side.

Q.6. Answer the following questions

- a. Explain Double field revolving theory, in single phase Induction motor. **10M**
- b. What is the Oscillating neutral phenomenon in three phase transformers. **10M**