QP Code : 31082

(3 Hours)

Total marks: 80

Note: 1) Question No.1 is compulsory.
2) Attempt any three questions out of remaining five question.
3) Assume suitable data if required.

1. Solve any four each carry equal marks :- **(20)**
   a) Explain connection and phasor diagram of Dy11 and Yy6 transformer.
   b) Explain Crawling of Induction Motor with suitable diagram.
   c) Explain similarity between Transformer and Induction Motor. Why induction machine called generalized transformer?
   d) Discuss double field revolving theory of single phase IM.
   e) Explain need of parallel operation of transformer and write necessary condition for parallel operation.

2. a) What is Switching inrush current? Explain Switching in phenomena in 3-phase transformer. **(10)**

   a) A load of 1400 KVA at 0.866 pf lagging is supplied by two 3-phase transformer of 1000 KVA and 500 KVA operating in parallel. The ratio of transformation is same in both 6600/400 delta/star. If the equivalent secondary impedances are $(0.001+ j0.003)\Omega$ and $(0.0028 +j0.005)\Omega$ per phase respectively. Calculate power factor and load shared by each transformer. **(10)**

3. a) Explain torque-speed characteristic of three phase Induction motor and discuss the effect of Resistance on torque speed characteristic. **(08)**

   b) A 15 KW, 400V, 4 pole, 50 Hz, 3-phase star connected IM gave following test result: **(12)**

	Line Voltage	Line current	Power Input
No-load Test	400V	9A	1310W
Block rotor Test	200V	50A	7100W

   Stator and rotor ohmic losses at standstill are assumed equal. Draw circle diagram for Induction Motor and Calculate:
   a) Line current power factor , slip , torque , efficiency at full load
   b) Max. Power output and max. Torque.

4. a) Explain need of starter for three phase IM and explain star delta starter in detail with Suitable diagram. **(10)**
   b) Discuss V/F control method of speed control with speed-torque characteristic. **(10)**

5. a) Draw equivalent circuit diagram of single phase Induction motor for no load & block rotor test and find its parameters **(10)**

   b) Describe the principle of operation of Capacitor start and capacitor run induction motor along with torque speed characteristic. Draw circuit and phasor diagram and state its application. **(10)**

6. Write short note on any two: **(20)**
   a) Scott connection of three phase transformer.
   b) Induction Generator.
   c) Power flow of 3-phase Induction motor.

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