

QP Code : 3273
[Total Marks : 80

(3 Hours)

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

Q.1	Marks
(a) Define inrush current in three phase transformer	20
(b) Explain the Dd0 phasor group of three phase transformer connection along with connection diagram and phasor diagram	05
(c) Name the different methods of starting of single phase induction motor and explain any one	05
(d) Explain the working principle of three phase induction motor	05
Q.2	20
(a) A three phase, star connected, 400V, 50Hz, 4 pole induction motor has the following per phase constants in ohm referred to stator $R_1=0.15$, $X_1=0.45$, $R_2=0.12$, $X_2=0.45$, $X_m=28.5$ Fixed losses (core and friction and windage losses) = 400 w. compute stator current, rotor speed, output torque and efficiency when motor is operated at rated voltage and frequency at a slip of 4%	
(b) Explain star-delta starter for a 3 phase induction motor. Derive the expression for starting current and starting torque.	10
Q.3	20
(a) Explain the necessity of controlling voltage along with frequency for speed control of an induction motor for v/f control method. Also draw torque-speed characteristic for constant v/f ratio at different frequencies.	10
(b) Explain double field revolving theory for a single phase induction motor.	10
Q.4	20
(a) A 500 KVA, 3 phase transformer, having per phase leakage impedance of $0.004 + j0.018$ ohm is connected in parallel with another transformer of the same voltage ratio having a rating of 1000KVA and per phase leakage impedance of $0.002 + j0.012$ ohm. Find the load shared by each transformer and their operating power factors for a load of 1500KVA at 0.8 pf lagging.	10
(b) Conditions required for successful parallel operation of three phase transformers	10
Q.5	20
(a) Draw & explain torque-speed characteristics of 3 phase induction motor at variable rotor resistance.	
(b) Develop equivalent circuit for a single phase induction motor.	
Q.6 Write a short note on (any two)	20
(a) Excitation phenomenon in 3 phase transformer	
(b) Oscillating neutral	
(c) Double cage induction motor	