19 DEC. 2025 SE ELECTRICAL (SEM-IV) C SCHEME EAM-I QP CODE: 10094763

(Time: 3 Hours) **(Total Marks: 80)**

N.B: (1) Question No. 1 is compulsory.
(2) Attempt any three from the remaining questions.
(3) Figures to the right indicate full marks.
(4) Each question is of 20 Marks.

Q. 1	**Answer following questions.**	**20M**
a.	Explain the working principle of transformer.	5M
b.	State the advantages and disadvantages of autotransformer.	5M
c.	Explain power stages of 3 Phase I. M.	5M
d.	Explain need of starter for 3 Phase induction motor.	5M
Q. 2	**Answer following questions.**	**20M**
a.	Develop equivalent circuit of single-phase transformer from no load and short circuit test.	10M
b.	Draw and explain open delta connection of transformer in detail.	10M
Q. 3	**Answer following questions.**	**20M**
a.	Draw and explain oscillating neutral phenomenon of three phase transformer in detail.	10M
b.	Draw and explain Torque-speed characteristics of 3 phase induction motor in braking, motoring and generating regions.	10M
Q. 4	**Answer following questions.**	**20M**
a.	A 3-phase star connected 400V, 50 Hz, 4 pole induction motor has the following constants in ohms per phase 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 = 400watts, slip of 0.04 Calculate 1) Stator current 2) Output torque 3) Efficiency	10M
b.	Explain different speed controlling methods for 3 phase induction motor.	10M
Q. 5	**Answer following questions.**	**20M**
a.	Draw and explain Scott connection of transformer in detail.	10M
b.	Explain about copper saving in autotransformer.	10M
Q. 6	**Answer following questions.**	**20M**
a.	Explain the construction and working of split phase induction motor.	10M
b.	The following data relates to tests on 110 volt, 150 watts, 50 Hz, 6pole, single phase induction motor. No load test: 110 volts, 63 Watts, 2.7 amps. Blocked rotor test: 55 volts, 212 watts, 5.8 amp. The stator winding resistance is 2.5 ohms and during blocked rotor test, the starting winding is open. Determine the equivalent circuit parameters. Also find the core, friction and windage losses.	10M

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