

Code No: 54012

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech II Year II Semester Examinations, May - 2019****ELECTRICAL MACHINES – II****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

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- 1.a) Explain constructional details and principle of operation of a single-phase transformer.
b) What are Iron losses in transformers? Explain about the various factors affecting it and methods employed to minimize it. [7+8]
- 2.a) Derive the equivalent circuit of a single phase transformer.
b) Define regulation of a transformer. Derive the expression for regulation. [8+7]
- 3.a) A 10kVA, 230V/3300V, 1- ϕ transformer gave the following reading on OC and SC test.
O.C test on LV side: $V = 230$ Volts
 $I_o = 3$ A
 $W_o = 100$ Watts.
S.C test on HV side: $V = 250$ Volts
 $I_{sc} = 1.5$ A
 $W_{sc} = 200$ Watts.
Determine the efficiency of the transformer at i) Half-Full load ii) Full-Load Condition.
b) Briefly explain the various conditions required for parallel operation of two transformers. Explain, what happens if they have different voltage drops. [8+7]
- 4.a) Explain about poly phase transformers with their connections.
b) Explain 3 ϕ to 2 ϕ conversion through scott connection of transformers. Draw the necessary phasor diagrams. [7+8]
- 5.a) Explain the principle of operation and constructional details of poly phase induction motors.
b) Explain how rotating magnetic field is produced in 3 ϕ induction machines. Draw the phasor diagrams. [7+8]
- 6.a) Draw the equivalent circuit diagram of 3 ϕ induction motor and then deduce the expression for torque developed by the machine, maximum torque and starting torque.
b) Explain crawling and cogging phenomenon in induction machines. [8+7]
- 7.a) Explain the procedure for conducting no-load and blocked rotor test on 3 ϕ induction motor.
b) Discuss various methods of starting 3 ϕ induction motors and compare them with respect to starting torque and starting current. [7+8]
8. Explain the following speed control techniques with necessary torque slip characteristics.
a) Change of poles b) Cascade connection c) Change of frequency
d) Injection of an emf into motor circuit. [15]

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