Reg. No.



III SEM. B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE-UP EXAMINATIONS, MAY 2018

SUBJECT: ELECTRICAL MACHINERY -I [ELE 2103]

REVISED CREDIT SYSTEM

Time:9.00 AM – 12.00 PM	Date: 10 May 2018	Max. Marks: 50
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Instructions to Candidates:

- ✤ Answer ALL the questions.
- Use of non-programmable scientific calculator is permitted.
- Graph sheet will be provided

1A. A 1Phase, 50 Hz, 5 kVA, 220 / 440 V transformer gave the following test results:

	Voltmeter Reading	Ammeter Reading	Wattmeter Reading
OC Test	220 V	2 A	100 W
SC Test	40 V	11.4 A	200 W

Draw the approximate equivalent circuit of the transformer referred to the primary side.

- **1B.** For the transformer described in Q1A, determine the efficiency and voltage regulation when the transformer is supplying rated load at 0.8 p.f lag.
- **2A.** Determine the All-Day efficiency of the transformer mentioned in Q1A for the following loads during the day

Duration	Load kVA and p.f
12 AM – 6.00 AM	No load
6.00 AM – 6.00 PM	Rated kVA at 0.8 p.f lag
6.00 PM – 12.00 PM	3/4 of rated kVA at UPF

(06)

(04)

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(04)

- **2B.** The transformer described in Q1A, is required to be connected as an auto transformer with primary applied voltage being 220V and secondary voltage of 660 V.
 - a) Draw the connection diagram for the auto transformer
 - b) Determine the transformed VA and conducted VA
- 3A. With neat diagram, explain the construction and working of a 1 phase capacitor start capacitor run induction motor. (05)
 3B. Why are starters passagery for three phase induction motor? With a post sketch
- **3B.** Why are starters necessary for three phase induction motor?. With a neat sketch explain the Star-Delta type of Starter for three phase Induction motor. (05)

4A. A 3 phase, 400 V, 50 Hz, 6 pole star connected induction motor has the following test data:

No load Test	: 400 V, 9 A, 1250 W (Line Value)
Blocked Rotor test	: 200 V, 50 A, 6930 W (Line Value)

Draw the circle diagram and determine the output power and torque produced when the motor is drawing a current of 20 A. Assume stator and rotor copper losses to be equal.

- **4B.** With a neat sketch, explain deep bar rotor construction and list the advantages / disadvantages over the circular bar rotor construction
- **5A.** A long shunt DC compound generator delivers a load current of 50 A at 500 V and has armature, series field and shunt field resistances of 0.05 Ω , 0.03 Ω and 250 Ω respectively. The armature consists of 400 lap wound conductors. The net field flux per pole is 30 mWb. Neglecting armature reaction drop and brush drop determine:

a) Generated e.m.f

- b) Speed at which the generator is running (05)
- **5B.** With neat sketches, explain the process of commutation in DC generators (05)

(06)

(04)