



COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical and Control Engineering

Lecturer : STAFF

Course : Electrical Power & Machines Marks : 40

Course Code : EE 328 Start time: 14:00

Date : 17/1/2015 Time : 2 hour

Final Examination paper

- 1.a) State how you can control the speed of a dc motor. (3 Marks)
- 1.b) A dc shunt motor has armature and field resistances of 0.5 and 250 Ω , respectively. When the motor runs at 900 rpm, it draws 18 A from a 250 V source, calculate: (7 Marks)
- The rotational speed if a 2.5 Ω resistor is connected in series with the motor
 - The developed power and developed torque at both speeds

2) A 10 kVA, 1000/500 V, 50 Hz, single phase transformer gave the following test readings:

Open Circuit Test: 1000 V, 1 A, 100 W (L.V. side open)

Short Circuit Test: 25 V, 10 A, 60 W (L.V. side shorted)

- Calculate the transformer parameters and draw the equivalent circuit referred to primary
- Find the efficiency at full load, 0.8 lagging power factor

(10 Marks)

3.a) Mention the conditions that must be satisfied before a synchronous generator can be synchronized in parallel with another generator or with the main grid system

(4 Marks)

Members of course Examination Committee:	Signature of Members of course Examination Committee:	Date:
Lecturers: Prof. Ahmed Refaat		17 /1/2015
Course Coordinator: Dr Ahmed Kadry		17 /1/2015
Head of Department: Prof. Hamdy Ashour		17 /1/2015

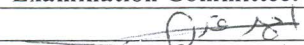


3.b) A 80 kW 3-phase load is supplied by a three-phase, star connected, synchronous generator at 0.8 lagging power factor. If the line voltage is 1200 V and the per phase armature resistance and reactance are 0.3Ω and 2Ω respectively. Find: **(6 Marks)**

- i) Voltage regulation
- ii) Efficiency, if the rotational losses are 1000 W.
- iii) Sketch a phasor diagram

4.a) A 20 Hp, four poles, three-phase, 500 V, 50 Hz induction motor runs at 1450 rpm when operated at rated load at a power factor of 0.8 lagging. The total stator losses and the rotational losses are found equal to 1200 W and 746 W respectively. Calculate the following: **(6 Marks)**

- (i) Motor slip
- (ii) Rotor copper losses
- (iii) Motor input current
- (iv) Motor Efficiency

4.b) A factory consumes an apparent power of 5000 kVA at a power factor of 0.8 lagging. Calculate the capacity of the required capacitor bank (in kvars) to achieve 0.9 lagging power factor. Draw the power triangle **(4 Marks)**

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