



COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical & Control Engineering

Lecturer : Prof. Samah El Safty

Course : Power System III

Course Code : EE 544

Marks : 40

Date : 10/1/2015

Time : 2 hour

Final Exam

Answer all the following questions

Each question is 4 marks

1. Define the following:
 - a) Reliability
 - b) Failure rate

[A1]

2. Twenty transformers were tested for 600 h each, three transformers failed after the following test time periods

One failed after 30 h

One failed after 50 h

One failed after 40 h

What is the failure rate of this type of transformers?

[B9]

3. For the system shown in Figure 1, find minimal cut sets

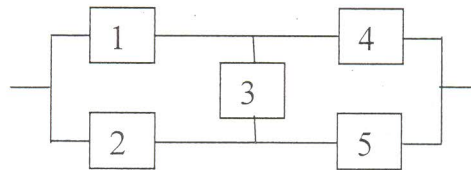


Figure 1

[B2]

4. Find the reliability of the system shown in Figure 1, using minimal cut set method, if the failure rate of each component is 0.01.

[B2,9]

5. Find the capacity outage probability table for 2 units each 150 MW, if the failure rate of each unit is 0.02.

[B9]

6. Mention three different types of load forecast and discuss the importance of each type.

[A1]

Members of course Examination Committee:	Signature:	Date:
Lecturer: Prof. Samah El Safty	<i>Sd/S</i>	6/1/2015
Course Coordinator : Prof. Amany Hanafy	<i>AH</i>	6/1/2015
Head of Department: Prof. Hamdy Ashour	<i>Hamdy</i>	6/1/2015

7. The demand load for four successive years is given in the following table, find the forecast for the next four years using a three period moving average.

Year	Demand (MW)
2006	10000
2007	12000
2008	13000
2009	15000

[C17]

8. State five types of power quality disturbances.

[A1]

9. A periodic, sinusoidal voltage of instantaneous value $v = 200 \sin \omega t$ V, is applied to a nonlinear load impedance. The resulting instantaneous current is $i = 20 \sin(\omega t + 45^\circ) + 10 \sin(3\omega t + 30^\circ) + 7 \sin(5\omega t + 20^\circ)$ A. Calculate the components **P**, **Q** and hence calculate the displacement factor, the distortion factor and the power factor.

[B2]

10. What is SCADA system. Mention the main components of a SCADA system.

[A1]

GOOD LUCK

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