Kafrelsheikh University ٨٢
Faculty of Engineering
Department: Electrical Power and Machines
Year: 4th (2007) /2016-2017
Subject: Networks Security.

Date: 17-1-2017
Time Allowed: 2hrs
Full Mark: 40 Marks
Final Exam: 1st Term.
No of pages: 1

Answer the Following Questions :

Question (1) **(10 Marks)**

a) ***Explain*** the relation of power system reliability, adequacy and security according to NERC definition of reliability.

b) From security point of view, the "time to perform" a remedial action in electrical power system is important to define the state of operation, ***explain***.

c) ***State*** the time- scale security analysis of an electrical power system.

d) ***Discuss*** the threats that can cause a complete breakdown of a power system.

Question (2): **(10 Marks)**

a) ***Discuss*** the term "monitoring" for the real-time security managing of electrical power system.

b) ***Define*** the state estimation for power system secure operation?

c) ***Describe*** briefly SCADA system, and ***mention*** its main differences in both traditional and smart grids.

d) ***Compare*** between traditional and smart grids according to the time-scale security analysis.

Question (3): **(10 Marks)**

a) ***Explain*** the difference between unit commitment and the optimal power flow in automated power system.

b) ***Explain*** briefly the terms of "FACTS" and demand –side management "DSM".

c) ***Discuss*** a method used, in smart grid environment, to withstand the increase in power flow in transmission line of electrical power system for short-term security managing.

Question (4): **(10 Marks)**

a) ***What*** are the requirements that mid-term operation tends to satisfy for a secure operation?

b) ***Discuss*** the impact of security in long-term planning of generation in case of restructured power system and that of vertically integrated power system.

c) From your study, ***is*** there coordination among different terms of time-scale security analysis? ***Discuss***.

Best wishes

Dr. Amlak Abaza

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