Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

EE3EW01 / EX3EW01

Advanced Power System Analysis

Programme: B.Tech. Branch/Specialisation: EE/EX

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Power is proportional to, in case of constant power load model- **1**
(a) Voltage (b) Voltage square
(c) Constant (d) None of these

ii. Which limit determines line loadability for the line length up to 80 km- **1**
(a) Radial (b) Voltage drop
(c) Thermal (d) Stability

iii. Which type of compensation is termed as self-regulating- **1**
(a) Series (b) Shunt (c) Complex (d) None of these

iv. For increasing the line loadability, which option is better- **1**
(a) Compensation (b) Depreciation
(c) Completion (d) None of these

v. On load tap changing transformer provides which type of control- **1**
(a) Real power flow (b) Reactive power flow
(c) Time period (d) None of these

vi. The sensitivity of reactive power with respect to the bus voltage is- **1**
(a) Infinite (b) High
(c) Very low almost zero (d) Can't say

vii. The worst blackout in recent history occurred in northern India on two consecutive days in- **1**
(a) 30-31 July,2012 (b) 10-11 July,2012
(c) 20-21 June,2012 (d) 10-11 Sept,2010

viii. Which is not a power system security level- **1**
(a) Normal (b) Alert (c) Emergency (d) Inductive

P.T.O.

ix. The simplest AC security analysis procedure merely needs to run an- **1**
(a) Stability (b) AC load flow
(c) Impedance (d) Capacitance

x. The voltage instability and collapse may occur in a time frame of- **1**
(a) Minutes (b) Hours (c) Years (d) Seconds

Q.2 i. Explain the static load modelling in detail with proper mathematical relationships. **4**

ii. Draw and explain the capability curves for alternator. Give proper reasons for all the limits. **6**

OR iii. Define any one power system network reduction techniques with suitable example and mathematical relationships. **6**

Q.3 i. Give four effects of compensation in power system network with details. **4**

ii. Explain uniform series compensation and derive for it. Write its effects on surge impedance and loadability with mathematical details. **6**

OR iii. Elaborate the uniform shunts compensation. Also, derive for it. How it affects the loadability. **6**

Q.4 i. What do you mean by sensitivity analysis? Discuss. **4**

ii. Formulate and explain the line outage distribution factor. **6**

OR iii. Formulate and explain the compensated shift factor. **6**

Q.5 i. What do you mean by security analysis? Discuss. **4**

ii. Explain in detail the different levels of power system security. Also, draw the suitable block diagram for it. **6**

OR iii. Explain in detail the corrective rescheduling in pre-contingency and post-contingency conditions. **6**

Q.6 Attempt any two:

i. Write down the difference between angle stability and voltage stability. **5**

ii. Discuss in brief about proximity and mechanism criteria. **5**

iii. Explain voltage stability assessment using PV curve. **5**

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Marking Scheme
EE-EX3EW01 Advance Power System Analysis

Q.1	i)	(c) Constant	**1**
	ii)	(c) Thermal	**1**
	iii)	(a) Series	**1**
	iv)	(a) Compensation	**1**
	v)	b) Reactive power flow	**1**
	vi)	b) High	**1**
	vii)	a) 30-31 July,2012	**1**
	viii)	d) Inductive	**1**
	ix)	b) AC load flow	**1**
	x)	d) Seconds	**1**
Q.2	i.	Explanation, mathematical relationships	**2,2**
	ii.	Draw, explanation, reasons	**2,2,2**
OR	iii.	Explanation, mathematical relationships	**4,2**
Q.3	i.	four effects	**4X1**
	ii.	Explanation, derivation, effects	**2,2,2**
OR	iii.	Explanation, derivation, effects	**2,2,2**
Q.4	i.	Sensitivity analysis	**4**
	ii.	Formulate and explain	**4,2**
OR	iii.	Formulate and explain	**4,2**
Q.5	i.	security analysis	**4**
	ii.	Explanation, diagram	**4,2**
OR	iii.	pre-contingency and post-contingency	**3,3**
Q.6			
	i.	differences	**5**
	ii.	Proximity and mechanism criteria.	**2.5X2**
	iii.	Explanation, diagram	**3,2**

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