Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

EE5EL02 Computer Application in Power Systems

Programme: M.Tech. Branch/Specialisation: EE

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. Practical loading of underground transmission cables is- **1**

(a) Less than Surge Impedance Loading (SIL)
(b) More than SIL
(c) Equal to SIL
(d) None of these

ii. Deregulated power industry is governed by- **1**

(a) Generating companies
(b) Transmission companies
(c) Local load dispatch centre
(d) Independent system operator (ISO)

iii. Bus participation factor can be obtained by- **1**

(a) Eigen Analysis (b) Model analysis
(c) Both (a) and (b) (d) None of these

iv. Sherman Morison method is used for- **1**

(a) Inverse of a matrix
(b) Square of a matrix
(c) Left Eigen vector of a matrix
(d) Right eigen vector of a matrix

v. A 101-bus power system network contains 5 generator buses and one load bus connected with variable reactive control unit. What will be the size of jacobian matrix for N-R load flow analysis in this system? **1**

(a) 194 * 194 (b) 193 * 193 (c) 196 * 196 (d) 195 * 195

vi. At maximum loading point the minimum eigen value of load flow Jacobian is- **1**

(a) Close to 0 (b) Close to 1 (c) 0 (d) 1

P.T.O.

vii. Contingency analysis comes under- **1**
(a) Stabilities studies (b) Reliabilities studies
(c) Economic power studies (d) Securities studies

viii. Ability of power system to withstand under contingent conditions is- **1**
(a) Power system Stability (b) Power system Reliability
(c) Power system Security (d) Power system Resilience

ix. In which of the following forecasting technique, data obtained from past experience is analysed? **1**
(a) Time-Series forecast (b) Judgemental forecast
(c) Associative model (d) All of these

x. SAIFI stands for- **1**
(a) System Associative index for Frequency Interruption
(b) System Analytical Integral Frequency Index
(c) System Average Incoming Frequency Index
(d) System Average Interruption Frequency Index

Q.2 i. Why deregulated system is required? **2**
ii. Describe the various factors affecting deregulated power system. **3**
iii. Explain the planning process of a typical deregulated power system with the help of block diagram. **5**
OR iv. What do you mean by power transfer capability of the system? Define the following terms: **5**
(a) Total Transmission Capability (b) Available Transfer Capacity

Q.3 i. Define in brief 'Sherman Morison Method' for matrix inversion. **2**
ii. Explain solution of linear algebraic equation using LU factorization. **8**
OR iii. Define participation factor. Derive expression for participation factor based on model analysis using reduced load flow Jacobian. **8**

Q.4 i. What is meant by optimal power flow studies in power system? What are the objectives of optimal power flow? **3**
ii. Derive the load flow equations in polar form. Explain the N-R method of load flow with the help of flow chart. **7**
OR iii. Explain in detail the FDLF method of load flow solution. **7**

Q.5 i. Explain briefly contingency ranking & analysis of power system. **4**

ii. Discuss various security levels and pre contingency and post contingency corrective rescheduling. **6**
OR iii. What is Line outage distribution factor (LODF)? Derive the expression for LODF. **6**

Q.6 Attempt any two:
i. Write a note on effect of preventive maintenance on LOLP calculation. **5**
ii. With respect to power system reliability define the following terms: **5**
(a) SAIFI (b) SAIDI
iii. Discuss various load models and evaluation of LOLP. **5**

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Scheme of Marking

MEDI-CAPS UNIVERSITY Knowledge is Power	Faculty of Engineering End Sem (Even) Examination May-2022 Computer Application in Power Systems EE5EL02 Programme: M.Tech. | Branch/Specialisation:

Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i)		1
	ii)		1
	iii)		1
	iv)		1
	v)		1
	vi)		1
	vii)		1
	viii)		1
	ix)		1
	x)		1
Q.2	i.	Re Regulation	2
	ii.	3 factors	1×3
	iii.	Block diagram, Process	2, 3
OR	iv.	PTC, TTC, ATC	1, 2, 2
Q.3	i.	Matrix inversion by SMW	2
	ii.	process (complete)	8
OR	iii.	P. factor, Derivation	3, 5
Q.4	i.	Optimal PF, objectives	2, 3
	ii.	NR flowchart, Method	3, 4
OR	iii.	FDLF	7
Q.5	i.	Ranking, Analysis	2, 3
	ii.	Security level, Rescheduling	3, 3
OR	iii.	LODF, Derivation	3, 4
Q.6			
	i.	LOLP calculation.	5
	ii.	CAIFI, SAIDI	2.5, 2.5
	iii.	Load model, evaluating LOLP	5, 2

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Answers of MCQs

1- a
2- d
3- b
4- a
5- d
6- c
7- d
8- c
9- a
10- d