MR 15

Code No.: **52110**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.-500 100.

M.TECH II SEMESTER REGULAR END EXAMINATIONS, JULY-2017

SUBJECT: **POWER SYSTEM DYNAMICS**

Branch/Specialization: EEE/Electrical Power Systems

Time: **3 Hours** Max Marks: **60**

PART-A

Answer the following Questions **5 X 4 Marks=20 Marks**

1. Explain briefly about equal area criterion?
2. Explain briefly about Park's transformation of synchronous machine?
3. Explain briefly about DC excitation system?
4. Explain small signal analysis with block diagram representation?
5. Explain about lag-lead compensator in PSS?

PART-B

Answer any 5 questions **5 X 8 Marks=40 Marks**

1. a) Discuss in detail about transient stability and steady state stability of power system. 4M
   b) Explain simplified representation of excitation control? 4M

2. a) Explain analysis of load generator? 4M
   b) Explain analysis of steady state performance of unload generator? 4M

3. a) Explain dynamics of synchronous generator connected to infinite bus? 4M
   b) Explain a typical excitation system in detail with the help of the block diagram? 4M

4) a) Explain characteristic equation and application of routh Hurwitz criterion? 4M
   b) Explain the effect of Excitation System on Small Signal Stability of the single machine infinite bus system? 4M

5) a) Explain the basic concepts of Power System Stabilizer with a neat block diagram? 4M+4M
   b) Explain dynamic compensator analysis of single machine infinite bus system with PSS?

6 a) Explain excitation system representation by state equations? 4M
   b) Explain equivalent circuit parameter determination by quadrature axis? 4M

7 a) Explain excitation system modeling for terminal voltage transducer and load compensation?
   b) Explain synchronizing and damping torque analysis of single machine system? 4M+ 4M

8 Write short notes on any two of the following
   a) Explain state of operation & system security? 4M
   b) Explain rotor base quantities of synchronous machine? 4M
   c) Explain washout circuit? 4M

Code No.: **52111**

MR 15 –2016-17 Admitted Students

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.-500 100.

M.TECH II SEMESTER REGULAR END EXAMINATIONS, JULY-2017

SUBJECT: **FLEXIBLE AC TRANSMISSION SYSTEMS (FACTS)**

Branch/Specialization: **EEE/ Electrical Power Systems**

Time: **3 Hours** Max Marks: **60**

PART-A

Answer the following Questions **5 X 4 Marks=20 Marks**

1. Discuss about power flow in an AC system.
2. Short notes on PWM converter.
3. How the Transient Stability can be improved?
4. Briefly Explain the operation of STATCOM (Converter based FACTS Controller).
5. What is Sub Synchronous Resonance (SSR)?

PART-B

Answer any 5 questions **5 X 8 Marks=40 Marks**

1. a) Distinguish Between Shunt and Series Compensation.
   b) Explain the working principle of switching converter type VAR generators.

2. a) Draw the Dynamic and Static Characteristics of SVC and Explain.
   b) Distinguish between VSC and CSC.

3. Explain how series compensation is used for improvement of Transient Instability and how it will be tuned for power oscillation damping.

4. a) Discuss the operation of Three level Voltage source converter.
   b) Explain about transformer connection for 24 pulse operation.

5. List out the methods of Controllable Var Generators and explain any one of them.

6. a) What is the need of FACTS Controllers explain in detail
   b) Explain the dynamic stability considerations of a transmission system.

7. a) Explain the Thyristor Controlled Series Capacitor with waveforms
   b) Write short note on functional requirements of GTO Thyristor controlled series capacitor.

8. Write short notes on any two of the following
   a) What are the advantages of slope in SVC dynamic characteristics.
   b) Explain the Coordination of multiple facts devices using linear control technique for power flow.
   c) Explain Thyristor switched series capacitor (TSSC).

Code No.: **52112**

MR 15 –2016-17 Admitted Students

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.-500 100.

M.TECH II SEMESTER REGULAR END EXAMINATIONS, AUGUST-2017

SUBJECT: **POWER SYSTEM OPERATION AND DEREGULATION**

Branch/Specialization: **EEE/ Electrical Power Systems**

Time: **3 Hours** Max Marks: **60**

PART-A

Answer the following Questions **5 X 4 Marks=20 Marks**

1. What are the different methods to solve Optimal Power Flow.
2. What are the factors affecting power system security.
3. What is meant by Power system State Estimation.
4. What are the benefits of Deregulation.
5. Define ATC.

PART-B

Answer any 5 questions **5 X 8 Marks=40 Marks**

1. a) What is Gradient method? Explain with flow chart.
   b) Explain Interior Point Algorithm with neat flow chart.

2. a) State the applications of sensitivity factors for the security enhancement.
   b) How do you enhance the steady state security of a power system.

3. Explain the State Estimation of an AC network and solution algorithm.

4. Discuss the Network Observability in detail.

5. a) short notes on ATC & TTC.
   b) Explain ATC Calculation using PTDF and LODF based on DC Model.

6. a) Explain about Bus incremental costs.
   b) Discuss the linear sensitivity analysis.

7. a) What are the methods of determination of ATC
   b) Define different types of transmission pricing schemes.

8. Write short notes on any **TWO** of the following
   a)Matrix formulation
   b)Benefits of Restructured Power System
   c) Electricity Markets

Code No.: **52113**

MR 15- 2016-17 Admitted Students

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.-500 100.

M.TECH II SEMESTER REGULAR END EXAMINATIONS, AUGUST-2017

SUBJECT: **GAS INSULATED SYSTEMS**

Branch/Specialization: **EEE/Electrical Power Systems**

Time: **3 Hours** Max Marks: **60**

PART-A

Answer the following Questions **5 X 4 Marks=20 Marks**

1. Write specifications of SF6 gas for GIS application
2. Explain Main features of GIS
3. Explain switching relation to very Fast Transients
4. Discuss PD measurement method
5. Discuss planning of GIS station

PART-B

Answer any 5 questions **5 X 8 Marks=40 Marks**

1 a) what are the Electrical properties of SF_6 ?

b) Write Handling procedure of SF6 gas before use

2 Explain planning and installation components of GIS

3 How do you estimate different types of electrical stresses in GIS?

4 Explain the VFTO characteristics and effects

5 a) Write a short notes on SF6 gas decomposition

b) Explain characteristics of imperfections in insulation

6 a) Explain the testing of GIS for VFTO

b) Explain the Economics of GIS

7 a) Write a short notes on insulation coordination

b) Discuss estimation of different types of electrical stresses.

8 write short notes on any two of the following

a) AIS b) GIS c) SF6

Code No.: **52117**

MR 15- 2016-17 Admitted Students

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.-500 100.

M.TECH II SEMESTER REGULAR END EXAMINATIONS, AUGUST-2017

SUBJECT: **POWER SYSTEM RELIABILITY**

Branch/Specialization: **EEE/Electrical Power Systems**

Time: **3 Hours** Max Marks: **60**

PART-A

Answer the following Questions **5 X 4 Marks=20 Marks**

1. Define LOLP and LOLE.
2. What is the significance of consumer and load oriented reliability indices.
3. Define probability density and distribution factors.
4. Explain the recursive relation for unit addition in the generating system reliability evaluation.
5. Define availability and unavailability of generating units.

PART-B

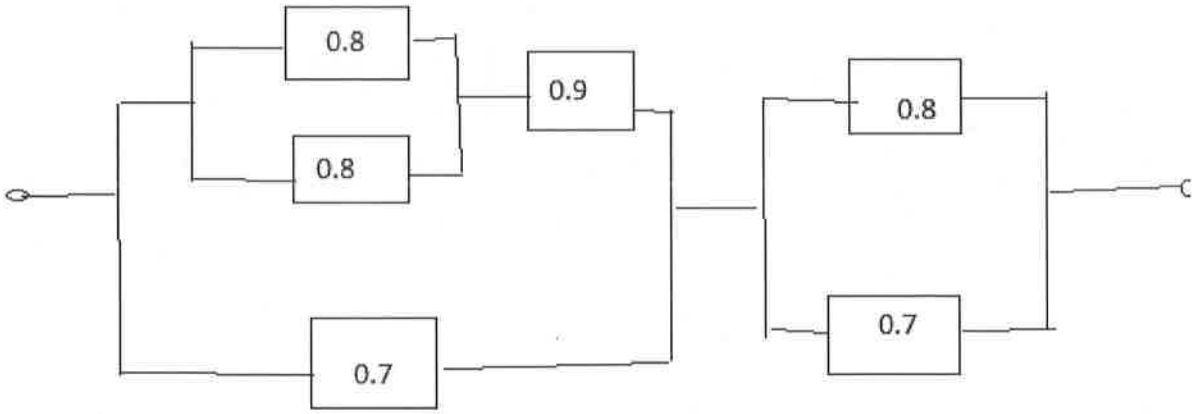
Answer any 5 questions **5 X 8 Marks=40 Marks**

1. The diameter of an electric cable ray X is assumed to be a continuous random variable with probability density function.

   $f(x)=6x(1-x),\ 0 \leq x \leq 1.$

   Determine a number b such that P[X< b]= P [x > b] [8]

2. Calculate the reliabilities of the system shown in the figure. [8]



3. Compute MTTF of the component having the failure rate of $Z(t)= a e^{-bt}$. [8]

4. A power system contains 4 generating units, 1, 2, 3 and4. Units 1, 2 and 3 have a capacity of 20MW and unit 4 has a capacity of 40 MW. The failure rate and the repair rate of each unit is 0.4/ year and 0.96/year respectively. Develop the combined capacity outage probability table. [8]
5. Derive the expressions for the frequencies of encountering individual states of a 2-component repairable system. [8]
6. Derive the expression for probability of failure of transmission line due to effect of weather using 2 weather model. [8]
7. Explain how loss of load probability can be estimated using load duration curve. [8]
8. **Write short note on any two**: [4+4]
   A. Temporary and transient failures in distribution system
   B. Various annualized system indices used for Bulk Power Systems Reliability Analysis.
   C. Two state Markov process of a single component with repair.

Code No.: **52121**

MR 15- 2016-17 Admitted Students

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via Kompally), Secunderabad-500 100.

M.TECH II SEMESTER REGULAR EXAMINATIONS, AUGUST - 2017

SUBJECT: **AI TECHNIQUES IN ELECTRICAL ENGINEERING**

Branch/Specialization: **EEE/Electrical Power Systems**

Time: **3 Hours** Max. Marks: 60

PART-A

Answer All Questions **5 X 4M = 20 Marks**

1. Compare biological neuron and artificial neuron?
2. Explain the learning factors of back propagation network
3. Write the properties of crisp sets.
4. Explain single site cross over and two point cross over.
5. Explain load frequency control with the help of AI technique.

PART-B

Answer any 5 Questions **5 X 8M = 40 Marks**

1. a) Explain simple model of an artificial neuron?
   b) Explain supervised & unsupervised learning methods.

2. a) Explain the model for multilayer perceptron.
   b) Explain the concept of Hopfield networks.

3. a) Write short notes on (i)Fuzzy Quantifiers (ii)Fuzzy interference.
   b) Write short notes on (i) Crisp logic (ii) Fuzzy logic.

4. a) Explain the different bitwise operators in GA.
   b) Write short notes on (i) Mutation (ii) Mutation rate.

5. Explain speed control of DC and AC motors using AI technique.

6. a) Describe the Mcculloch-pits (MP-Model) Neuron Model and explain this neuron Model with an example.
   b) Explain the dependency conditions of Back propagation Training algorithm.

7. a) Explain the complete architecture of fuzzy rule based system with block diagram approach.
   b) Explain the convergence of Genetic Algorithm.

8. Answer any **TWO**
   a) What is learning? Write any four learning laws and in each case give the expression for weight- updating
   b) Explain Dynamic stability with the help of with the help of AI technique.
   c) Explain the load forecasting with the help of AI technique.