Code No.: 80H18 | **MR18 (2019-2020)**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

M.TECH I SEMESTER REGULAR END EXAMINATIONS, JANUARY-2020

Subject: Research Methodology and IPR

Branch: **Common to All**

Time: 3 hours **Max. Marks: 70**

Answer ALL questions **5x14 = 70M**
All Questions carry equal marks

1. Discuss Scope and objectives of research problem.

(OR)

2. Elaborate the Different steps of Research Process.

3. How do you identify research gaps through Effective literature study approaches? Explain.

(OR)

4. What are the various steps in report writing? Discuss.

5. What are the various types of Intellectual Properties? Discuss its nature.

(OR)

6. Explain the Procedure for grants of patents and Patenting under PCT.

7. Explain with examples about the Scope of Patent Rights.

(OR)

8. Discuss with the current issues & developments about Geographical Indications of India.

9. Elucidate the new developments in IPR.

(OR)

10. What are the advantages & disadvantages of Traditional Knowledge?

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M.TECH I SEMESTER REGULAR END EXAMINATIONS, JANUARY-2020

Subject: Economic Operation of Power Systems

Branch: **EEE/EPS**

Time: 3 hours **Max. Marks: 70**

Answer ALL questions **5x14 = 70M**

All Questions carries equal marks

1. The incremental cost curves of three units are expressed in the form of polynomials

P_{G1}=-150+50(IC_1)-20(IC_1)^2

P_{G2} =-100+50(IC_2)-20(IC_2)^2

P_{G3} =-150+50(IC_3)-2(IC_3)^2.

The total demand at a certain hour of the day equals 200 MW. Develop a computer program that will render a solution for the optimum allocation of load among three units.

(OR)

2. a) Write the algorithm and draw the flow chart for obtaining optimal scheduling of thermal Generating units by neglecting the transmission losses.

b) Obtain approximate coordination equations of economic scheduling of thermal units with line losses neglected.

3. Draw the schematic diagram of speed governing system and explain the functions of various parts in it.

(OR)

4. a) Draw and explain different hydroelectric plant models.

b) Explain the necessity of mathematical modeling of speed Governor system.

5. Explain the concept of control area in a load frequency control problem and obtain the block diagram of single area load frequency control system.

(OR)

6. a) Draw the Block diagram of an isolated power system.

b) Block diagram for uncontrolled case of two area systems

7. a) Explain how both load frequency control and economic dispatch control can be obtained Simultaneously in a power system.

b) Obtain the steady state response of Two area system in uncontrolled case.

(OR)

8. Deduce relations to determine the frequency of oscillations of tie line power and static Frequency drop. List out assumptions made. An isolated power system has the following Parameters

Generator inertia constant = 5 seconds

Governor time constant = 0.2 seconds

Turbine time constant = 0.5 seconds

Governor speed regulation = 0.05 per unit

The load varies by 0.8 % for a load 1 % change in frequency, i.e., B = 0.8. The turbine rated output is 250 MW at a nominal frequency of 60 Hz. A sudden load change of 50 MW occurs in the system. Find steady frequency deviation in Hz.

9. A short transmission line has an impedance of (2+j3) ohms interconnect two power stations A and B both operating at 11 KV: equal in magnitude and phase. To transfer 25 MW at 0.8 p.f. lagging from A to B determine the voltage boost required at plant A

(OR)

10. Explain the operations of shunt and series compensator and mention its applications in power systems.

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M.TECH I SEMESTER REGULAR END EXAMINATIONS, JANUARY-2020

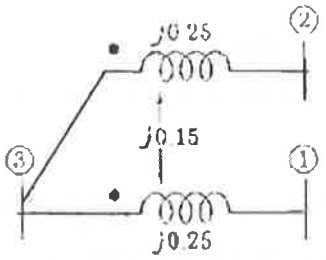
Subject: Advanced Power System Analysis

Branch: **EEE/EPS**

Time: 3 hours **Max. Marks: 70**

Answer ALL questions **5x14 = 70M**
All Questions carries equal marks

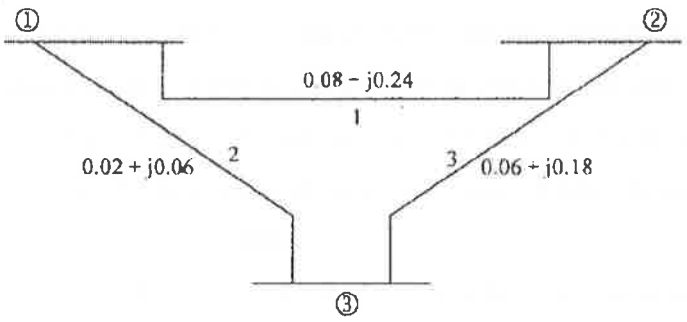
1. Two branches having impedances equal to j0.25 per unit are coupled through mutual impedance Z_M=j0.15 per unit as shown in figure below. Find the nodal admittance matrix for the mutually coupled branches and write the corresponding nodal admittance equations. Also explain the method to develop nodal admittance network of two mutually coupled network.



(OR)

2. Explain the steps involved in successive elimination method with an example of 4 bus system.

3. Form the bus admittance matrix using Z_{bus} building algorithm for the network shown in figure below. The values are marked in p.u.

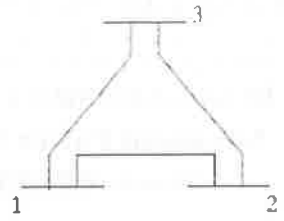


(OR)

4. a) Explain the significance of power invariant transformations in network calculations with example.

b) Explain concept of algorithms for building Z bus.

5. A 3-bus system is shown in Figure below. The line and bus data are given in pu. Neglect Line charging admittances.



Line data	
Line Between Buses	Series Admittance
1-2	2-j8
1-3	1-j5
2-3	1-j4

Bus data				
Bus No.	P	Q	V	Remarks
1	-	-	$1.04\angle 0^0$	Slack
2	0.2	0.2	-	PQ
3	0.1	0.3	-	PQ

Form Y_{bus} and compute voltages at buses 2 and 3 at the end of first iteration using GS Method of load flow analysis. Take acceleration factor as 1.6. Use flat start.

(OR)

6. Why is Fast Decoupled Load flow study so called? Explain the computational procedure for load flow solution using Fast Decoupled Load Flow method, when the system contains all types of buses.

7. Explain the formation of new Z_{bus} when addition and removal of lines in power system. Also explain the algorithmic steps to calculate bus voltages with addition of z_x and z_y between buses i-j and k-l.

(OR)

8. (a) Explain the contingency analysis of a system using DC power flow model.

(b) Write note on system reduction for contingency and fault analysis.

9. a) Write the significance of fault analysis. Classify the faults in the order of their severity. **[4M]**

b) Two generators A and B are similar and rated 15MVA, 10.5kV and have transient reactance of 35% at own base. The transformers are also identical, and are rated 7.5MVA,10.5/110kV and a have reactance of 6% to their own base MVA. The tie line is 75km and each conductor has reactance of 0.9 ohms per km. A symmetrical fault occurs at the point 35km from station A. Find the short circuit current and fault MVA. **[10M]**

(OR)

10. Draw the sequence network connection for LL fault at any point in a power system and obtain an expression for the fault current.

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M.TECH I SEMESTER REGULAR END EXAMINATIONS, JANUARY-2020

Subject: Power Quality

Branch: **EEE/EPS**

Time: 3 hours **Max. Marks: 70**

Answer ALL questions **5x14 = 70M**

All Questions carries equal marks

1. a) Discuss in detail about the Computer Business Equipment Manufacturers Associations (CBEMA) curve.

b) Explain briefly about international standards of power quality.

(OR)

2. Explain the following electrical power quality issues in detail with examples.

a) Voltage Sag

b) Voltage Swell

3. Discuss the sources of overvoltage due to following phenomena

a) Capacitor switching

b) Lightning

(OR)

4. Discuss the sources of transient over voltages in high, medium and low frequency range.

5. Explain the following

a) Harmonic sources from commercial loads

b) Harmonic sources from industrial loads.

(OR)

6. Explain the significance of harmonic index. Explain the general harmonic indices used universally in analyzing harmonic distortion.

7. Explain the IEEE and IEC standards in harmonic distortion.

(OR)

8. Briefly discuss about various reasons for grounding.

9. Discuss the power quality monitoring considerations in detail and explain the functional structure of an Expert system.

(OR)

10. Explain the flicker meter and flicker measurement techniques in detail.

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M.TECH I SEMESTER REGULAR END EXAMINATIONS, JANUARY-2020

Subject: Renewable Energy Systems

Branch: **EEE/EPS**

Time: 3 hours **Max. Marks: 70**

Answer ALL questions **5x14 = 70M**

All Questions carries equal marks

1. What is the principle of solar photo voltaic power generation? What are the main elements of a photovoltaic system?

(OR)

2. What is standalone and grid connected solar system? Explain with neat diagram.

3. Explain important factors to be considered for selecting materials for MHD generator.

(OR)

4. a) Describe the different schemes employed for wind generation with respect to wind generators. **[10M]**

b) What are the advantages and disadvantages of vertical axis wind mills over horizontal type? **[4M]**

5. Explain various methods for the utilization of tidal energy with its merits and demerits.

(OR)

6. What is Ocean Thermal Energy Conversion (OTEC)? Explain OTEC closed cycle clearly.

7. Explain various factors affecting the generation of biomass and also mention its features.

(OR)

8. Explain global energy position and environmental effects with examples.

9. What is fuel cell? Explain about various fuel cells and its applications.

(OR)

10. a). Explain with example battery application for large power.

b). Write short notes on pollution free energy system.