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 SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2019

Subject: **Research Methodology and IPR**

Branch/Specialization: **Common to EEE & CSE/Electrical Power Systems &**

Computer Science and Engineering

Time: 3 hours   Max. Marks: 70

PART – A

Answer ALL questions of the following   5x4Mark=20 Marks

1. What are the Errors in selecting a research problem?

2. What is your understanding on Research ethics?

3. Write about PCT.

4. What do you mean by Geographical Indications?

5. IPR Vs IITs.

PART-B

Answer ALL questions of the following   5x10Marks= 50 Marks

1. Explain the Characteristics of a good research problem

(OR)

2. What are the various approaches for a research problem? Discuss

3. Discuss in detail the process of Effective technical writing

(OR)

4. How do you Develop, Format and present a Research Proposal

5. Elaborate in detail the Process of Patenting and Development

(OR)

6. Distinguish between Indian and International Scenario of Intellectual Property

7. Discuss the different modes of technology transfer with their Pros & Cons.

(OR)

8. Elaborate in detail about the IPR database

9. Discuss the present status of Intellectual Property system in India

(OR)

10 Discuss the following of IPRs

   A) Biological Systems   B) Computer Software

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M.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2019

Subject: **Advanced Power System Analysis**

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

Time: 3 hours   Max. Marks: 70

PART – A

Answer ALL questions of the following   5x4Mark=20 Marks

1. How can the Gauss Elimination method be used for optimal ordering?

2. Illustrate the significance power invariant method with an example.

3. Compare Gauss Seidel, Newton Raphson and Fast Decoupled methods of load flow studies

4. Develop a simple algorithm for contingency analysis using DC power flow model.

5. Explain how the symmetrical fault analysis is used to determine the rating of the circuit breaker.

PART-B

Answer ALL questions of the following   5x10Marks= 50 Marks

1. Obtain the relation between the network bus incidence matrix and Y_{bus}. Also obtain the bus incidence matrix for the following network and hence find the Y_{bus}.
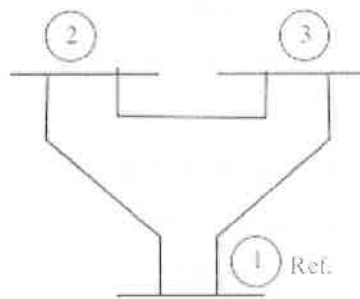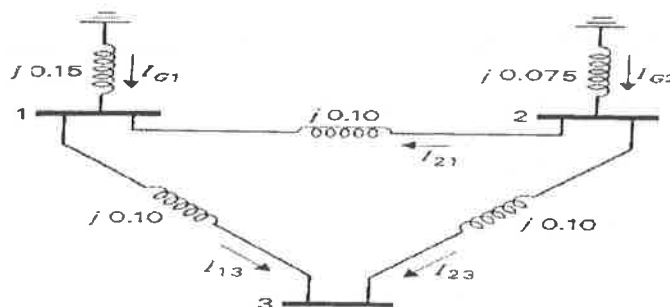

The line impedances of the network is given in the following table

Line (bus to bus)	1-2	1-3	2-3
Impedances in pu	0.02+j0.1	0.02+j0.1	0.05+j0.25

(OR)

2. Explain the significance of node elimination and triangular factorization methods in network calculations with relevant examples.

3. For a 3 bus system shown below, find Z_{bus} using Z_{bus} building algorithm.

(OR)

4. (a) Illustrate the use of Thevenin's theorem in forming Z_{bus} of a network.   (5)

   (b) Explain the changes in Z_{bus} due to mutually coupled branches.   (5)

5. Explain clearly with detailed flowchart the computational procedure for load flow solution using N – R method in polar co-ordinates, when the system contains all types of buses.

(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. The Z_{bus} of a power system is given by

$$[Z_{bus}] = \begin{bmatrix} j0.25 & j0.20 & j0.16 & j0.14 \\ j0.20 & j0.23 & j0.15 & j0.15 \\ j0.16 & j0.15 & j0.20 & j0.12 \\ j0.14 & j0.15 & j0.12 & j0.20 \end{bmatrix} p.u.$$

Assume $V_2 = 0.98\angle0^0 \, p.u.$; $V_3 = 0.975\angle0^0 \, p.u.$; $V_4 = 0.99\angle0^0 \, p.u.$ If two lines z_x and z_y of

p.u. reactances j0.05 and j0.06 are connected between bus 2-3 and 3-4 respectively, find

currents I_x and I_y flowing through z_x and z_y .

(OR)

8. Show how line currents are modified in healthy lines in power system following double line outage.

9. Explain the computational method of finding short circuit capacity, post fault voltage and currents when three phase fault occurs using Z – bus.

(OR)

10. The single line diagram of a power system network is shown below
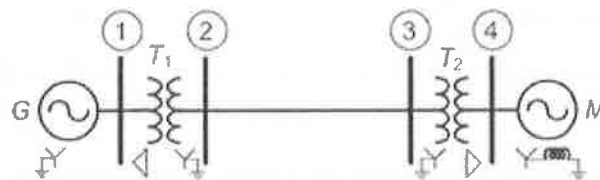
The system parameters are

    Generator G: 50MVA, 20kV, $X'' = X_1 = X_2 = 20\%, X_0 = 7.5\%$

    Motor   M: 40MVA, 20kV, $X'' = X_1 = X_2 = 20\%, X_0 = 10\%, X_n = 5\%$

    Transformer T_1 : 50MVA, $20kV\Delta/110kVY, X = 10\%$

    Transformer T_2 : 50MVA, $20kV\Delta/110kVY, X = 10\%$

    Transmission Line: $X_1 = X_2 = 24.2\Omega, X_0 = 60.5\Omega$

Find the fault current when line to ground fault occurs at bus 2.

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M.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2019

Subject: **Economic Operation of Power Systems**

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

Time: 3 hours   Max. Marks: 70

PART – A

Answer ALL questions of the following   5x4Mark=20 Marks

1. Write the computational methods for optimal allocation of load among the generating units without losses.
2. Draw and explain different hydroelectric plant models.
3. Explain the PI control of single area and its block diagram representation.
4. What is the major control loops used in large generators?
5. Explain the effect of series compensator on surge impedance.

PART-B

Answer ALL questions of the following   5x10Marks= 50 Marks

1. A power system consists of two 100MW units whose input cost data are represented by equations below :

    $C_1 = 0.04\ P_1^2 + 22P_1 + 800$ Rupees/hour

    $C_2 = 0.045\ P_2^2 + 15P_2 + 1000$ Rupees/hour

    If total received power $P_R = 150MW$. Determine the load sharing between units for most economic operation.

(OR)

2. The incremental costs in Rs/MWhr for two units in a plant are given by,

    $$\frac{df_1}{dp_1} = 1.0p_1 + 200 \ ; \quad \frac{df_2}{dp_2} = 1.2p_2 + 160$$

    The minimum and maximum generation on each unit is to be 20 MW and 125 MW, respectively. Determine the economic allocation between the units for a total load of 150 MW.

3. Derive the mathematical model of speed governing system and represent it by a block diagram.

(OR)

4. A two plant system that has a hydro plant near the load center and a steam plant at a remote location. The load is 400 MW for 14 hr a day and 200 MW , for 10 hr a day. The characteristics of the units are

    $C_1 = 150 + 60P_{GT} + 0.1\ P_{GT}^2$ Rs/hr

    $W_2 = 0.8P_{GH} + 0.000333P_{GH}^2\ m^3s$

    Loss coefficitent , $B_{22} = 0.001MW^{-1}$, Find the generation schedule, daily water used by the hydro plant , and the daily operating cost of a thermal plant for $\gamma_i = 77.5\ Rsm^3$ /hr.

5. Obtain the block diagram of two area system with necessary derivations.

(OR)

6. Explain the effect of integral gain on the performance of load frequency control in two area load frequency control.

7. Obtain the expression for change in frequency of single area system under steady state in free governor operation or uncontrolled case

(OR)

8. Obtain the expression for change in frequency of single area system under state integral controller.

9. a) Explain different sources and sinks of reactive power in a power system.

    b) Write the types of VAR generators.

(OR)

10. Describe the effects of connecting the series capacitors in transmission system.