Code No.: **20223** **MR12**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Power System Operation and Control**

Branch: **EEE**

Time: 3 hours **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15M=75M**

1. a) Explain the significance of various constraints used in the economic operation of power system. [7M]
   b) Incremental fuel cost in Rs/MWhr for two units in a plant are given by:
   $\frac{dF_1}{dP_1} = 0.1\,P_1 + 20$ and $\frac{dF_2}{dP_2} = 0.12\,P_1 + 16$
   The minimum and maximum loads on each unit are to be 25MW and 120 MW respectively. Determine the allocation of load for minimum cost. Also compare the cost of this to the case when generators share load equally if P_D=100 MW [8M]
2. a) Obtain the optimal operation of thermal power plants by taking losses in to consideration [7M]
   b) The incremental fuel cost in Rs/MWhr for two plant are given by:
   $\frac{dF_1}{dP_1} = 0.03\,P_1 + 16$ and $\frac{dF_2}{dP_2} = 0.05\,P_1 + 12$
   It has been observed that if the only load located at plant 2 of 200MW transmitted from plant1 with a loss of 16 MW. Determine the Bmm coefficients. P_1, P_2, P_{Lost} and P_{demand} with system λ=1.25. [8M]
3. a) Explain in detail about the optimal operation of short term Hydro thermal scheduling. [8M]
   b) In a combined system of one thermal plant and one hydro plant, the total load is a constant of 85 MW for a month of 30 days. Find the running time of the thermal plant if the maximum hydro energy is 50,000 MW hr. The cost function of the thermal plant is given by F_e=54+11 $P_{tn} + 0.02\,P_{tn^2}$ unit of cost /hr. [7M]
4. a) What is the role of speed governing system in a power plant? Discuss briefly. [5M]
   b) Discuss briefly
   i) Turbine Model ii) Excitation System Model [10M]
5. a) Obtain the steady state analysis of LFC of Isolated Power System when speed changer setting($\Delta P_c\ (s)$) is varying by keeping load as constant ($\Delta P_d\ (s)$) [5M]
   b) Obtain the dynamic response of LFC of an Isolated Power System for free governing operation. [10M]
6. a) Obtain the dynamic response of a 2-area controlled system. [9M]
   b) Two identical inter connected power areas each having regulation of 3Hz/PuMW, H = 8 sec and initial frequency = 50Hz. For the tie-line operating at power angle of 30° transferring power of 0.15pn. For a step load increase, find the oscillating frequency. [6M]
7. Discuss the importance of proportional plus integral control for LFC of an Isolated Power System. How it can improve the steady state response. [15M]
8. a) In a power system, there should not be any too wide variations in the voltage levels. Discuss briefly. [7M]
   b) How do you relate the reactive power with voltage? Derive the necessary equation. [8M]

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **HIGH VOLTAGE ENGINEERING**

Branch: **EEE**

Time: 3 hours **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15M=75M**

1. Explain various theories that explain breakdown limitation of each theory
2. a) Write town send's current growth equation and criterion for breakdown. **[8M]**
   b) Explain experimental determinations of co-efficients α & γ **[7M]**
3. a) What do you mean by 'Intrinsic strength' of a solid dielectric? Explain electric breakdown of solid mechanism. **[8M]**
   b) Explain thermal breakdown in solid dielectrics. How this mechanism is more significant than the other mechanisms? **[7M]**
4. Explain the generation circuits of
   a) Impulse wave and **[7M]**
   b) Switching surge voltages **[8M]**
5. a) Explain the working and construction of electrostatic voltmeter **[8M]**
   b) Explain the voltage double circuit with neat sketches **[7M]**
6. a) Explain the two different theories of charge generation and separation in a thunder cloud **[10M]**
   b) Discuss how insulation coordination to protective devices used for the protection of equipmentfrom over voltages **[5M]**
7. a) Explain a procedure to measure of resistivity of an insulation specimen. **[8M]**
   b) Draw a neat diagram of a high voltage Schering bridge and describe various features of the bridge **[7M]**
8. a) Explain the method of impulse testing of high voltage transformers, what is the procedure adopted for locating the failure **[8M]**
   b) What are the test conducted on isolators and circuit breaker? Explain in detail. **[7M]**