**Registration No:**

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## 2ⁿᵈ Semester Regular Examination 2016-17
## POWER SYSTEM CONTROL AND INSTRUMENTATION
**BRANCH: ELECTRI & ELECTRONIC ENGG (POWER SYSTEM ENGG), ELECTRICAL AND ELECTRONIC ENGG, ELECTRICAL ENGG., ELECTRICAL POWER SYSTEM, ENERGY SYSTEMS ENGG, INDUS.**
### Time: 3 Hours
## Max Marks: 100
### Q.CODE: Z838
**Answer Question No.1 which is compulsory and any FOUR from the rest.**
**The figures in the right hand margin indicate marks.**

**Q1** Answer the following questions: *Short answer type* **(2 x 10)**
- **a)** What is area control error?
- **b)** Define Penalty factor
- **c)** What is the function of AVR?
- **d)** What is tie line bias control?
- **e)** Define Voltage control methods.
- **f)** Why a fly ball speed governor is needed?
- **g)** What are the two major control loops used in large generator?
- **h)** Write down two methods for improvement of transient stability.
- **i)** Write the expression for transmission loss in terms of B coefficient
- **j)** What is the difference between AGC in isolated and interconnected power systems?

**Q2 a)** In a two-plant system, the entire load is located at plant 2, which is connected to plant 1 by a transmission line. Plant 1 supplies 200MW of power with a corresponding transmission loss of 10 MW. Calculate the penalty factors for the two plants. **(10)**
**b)** Explain Economic Dispatch control. **(10)**

**Q3 a)** Derive an expression for static error frequency & tie line power in an identical two-area system. **(10)**
**b)** Explain sub-optimal and decentralized controllers. **(10)**

**Q4 a)** What do you mean by remote terminal units? Explain the circuit diagram for the same. **(10)**
**b)** What is the difference between Emergency control and Preventive control? **(10)**

**Q5 a)** What do you understand by Discrete mode AGC? **(10)**
**b)** Explain Unit Commitment with proper diagram. **(10)**

**Q6 a)** Explain the Q-V and P-f control loops. **(10)**

**b)** Explain the different mechanism of real and reactive power control **(10)**

**Q7 a)** A 500 MW generator has a speed regulation of 4%.If the frequency drops by 0.12 Hz with an unchanged reference, determine the increase in turbine power? And also find by how much the reference power setting should be changed if the turbine power remains unchanged **(10)**

**b)** What are the co-ordination equations? Give their physical significance? **(10)**