

**Bachelor of Instrumentation and Electronics Engineering, Examination 2019**  
**(4<sup>th</sup> Year, 1<sup>st</sup> Semester)**

**Power Plant Instrumentation (Elective-I)**

**Time: Three Hours**

**Full Marks: 100**

**Answer any five questions**

1. a) Explain the functions of a controller for water tank temperature control system with suitable control algorithm. Discuss the possible sensor signal conditioning circuit for measuring the temperature.  
b) What are the important variables that need to be measured in power plant cycle?  
(12+4)+4
2. Explain how cascade control scheme improves the performance of a simple set point control? Is ratio control a kind of cascade or feed forward control? Explain.  
(15+5)
3. Draw the process flow diagram of steam and feed water cycle of a typical 210MW thermal power plant and explain the functions of economizer and the re-heater.  
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4. What are the limitations of a single element drum level control system? Explain with the loop diagram how 3-element drum level control system removes them.  
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5. Discuss the cross-limiting system in a combustion control system of a pulverized fuel fired boiler and explain the air flow control system with suitable process and instrumentation diagram.  
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6. Explain the super heated steam temperature control system with loop diagram.  
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7. Write short notes on any two of the followings: (2 x10)
  - a) Electrostatic precipitator.
  - b) Deaerator level control scheme.
  - c) Burner management system for a pulverized fuel fired boiler.