Ref. No.: Ex/IEE/PE/B/T/413B/2024

Bachelor of Instrumentation and Electronics Engineering, Examination 2024
(4th Year, 1st Semester)

Power Plant Instrumentation

Time: Three Hours **Full Marks: 100**

[CO1: Answer any one question from question number 1 and 2]

1. a) Differentiate between renewable and non-renewable energy sources.
   b) Write down the advantages and disadvantages of solar power plant.
   c) What are the factors affecting the efficiency of the thermal power plant?
   d) Give the disadvantages of nuclear power plant.

(6+6+4+4)

2. 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.

(16+4)

[CO2: Answer any three questions from question numbers 3-7]

3. Draw the process flow diagram of steam and feed water cycle of a typical 210MW thermal power plant and explain the functions of turbine and the re-heater.

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4. Write down the basic thermodynamic cycle employed in a thermal power plant. In what way this cycle is modified and why?

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5. 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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[Turn over

6. Discuss the cross-limiting system in a combustion control system of a pulverized fuel fired boiler and explain the air flow control with suitable process and instrumentation diagram.

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7. Why purging is required before start-up the furnace? Explain the burner management system for a pulverized fuel fired boiler.

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[CO3 and CO4: Question number 8 compulsory]

8. Write short notes on any <u>two</u> of the followings (Answer one question from a) and b) and other one question from c) and d)): (2 x10)

a) Discuss the overview of DCS.

b) Power plant safety.

c) Three transmitter system with median selector unit.

d) Explain briefly about fuel analyzer.