

B-036

31N505 / 31N0605

Roll No.

Total No. of Pages.: 04

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B.Tech III Sem Main/Back Exam 2025-26

Electrical and Electronics Engineering and Electrical Engineering

(3EX4-05/3EE4-05) – Power System Instrumentation

Common to EE, EX

Time : 3 Hours

Maximum Marks: 70

Min. Passing Marks:

Instructions to Candidates:

Part-A: Short answer questions (up to 25 words) 10x2 marks = 20 marks. All ten questions are compulsory.

Part- B: Analytical/Problem Solving questions 5x4 marks = 20 marks. Candidates have to answer 5 questions out of 7.

Part – C: Descriptive/Analytical/Problem Solving questions 3x10 marks = 30 marks. Candidates have to answer 3 questions out of 5.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1 _____NIL_____

2 _____NIL_____

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Part-A

- Q.1. Define probable error. [2]
- Q.2. What is the significance of the variance? [2]
- Q.3. What is parallax error? [2]
- Q.4. What LVDT stands for in instrumentation? [2]
- Q.5. What is the concept behind the working of thermocouple? [2]
- Q.6. Explain the analog multiplexer. [2]
- Q.7. What is the need of shielding and grounding? [2]
- Q.8. Which physical quantity is measured using RTD? [2]
- Q.9. What do you understand by inverse transducer? [2]
- Q.10. Why is the role of capacitance in the capacitive voltage transformer? [2]

PART-B

- Q.1. An unknown resistance, R_x is being measured using Wheatstone's Bridge by the following formulation,

$$R_x = \frac{R_1 R_2}{R_3}$$

Wherein $R_1 = 200 \pm 0.25\%$, $R_2 = 1000 \pm 0.5\%$ and $R_3 = 300 \pm 0.75\%$. Find the unknown resistance and limiting error in percentage. [4]

- [4]
- Q.2. What are the differences between the following-
- a) Transducer and Inverse Transducer
 - b) Active and Passive transducer
- Q.3. Explain the instrumental errors and observational errors with suitable examples. [4]
- Q.4. Explain the working of function generator. Which measurements can be taken by a function generator? [4]
- Q.5. Explain block diagram and working of isolation amplifiers with its merits and demerits.
- Q.6. Explain the industrial metering and various types of industrial tariffs. [4]
- Q.7. How the Optical and magnetic Isolators work. [4]

PART- C

- Q.1. What are the different selection criteria for selecting a transducer? Explain the input, output and transfer characteristics of a transducer. [10]
- Q.2. Explain the working of resistance thermometer. What are the materials used for the resistance temperature detector? Also explain the properties of the material. [10]
- Q.3. Explain the working of Capacitive Voltage Transform (CVT) along with its transient behavior. [10]

Q.4. What are the roles of the data acquisition system for the operation, maintenance and protection of the power plant. [10]

Q.5. Write note on the following- [5x2 = 10]

a) Instrumentation amplifiers

b) Timers
