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Question Paper Code : 10231

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

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Second Semester

Electronics and Communication Engineering

BE 3254 – ELECTRICAL AND INSTRUMENTATION ENGINEERING

(Common to : Electronics Engineering (VLSI Design and Technology)/ Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the application of a transformer.
2. What is the usage of auto transformer?
3. Write the EMF equation of a DC motor.
4. Give the different types of Stepper motor.
5. Write the working principle of induction motors.
6. Define voltage regulation.
7. Write the need for calibration.
8. Compare moving iron and moving coil meters.
9. What is the need for earthing?
10. Mention the safety precaution to be followed to prevent earth leakage.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the working principles of single phase transformer with equivalent diagram.

Or

(b) Explain the operation of three phase transformers with relevant diagram.

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12. (a) Explain the construction and working principles of DC motor with relevant diagram.

Or

(b) Discuss the construction and working principle of stepper motor.

13. (a) Explain the principle of operation of single-phase induction motor with its equivalent circuit.

Or

(b) Explain the working principle and derive the expression for induced EMF of alternator.

14. (a) Explain the working principle of moving coil meter. Comment on its merits and demerits.

Or

(b) Explain the construction and working principle of Energy meter, with relevant diagram.

15. (a) Draw and explain the single line diagram of a power system structure for generation and transmission.

Or

(b) Explain any two protective devices used for earthing and earth leakage.

PART C — (1 × 15 = 15 marks)

16. (a) (i) Explain any one method to measure three phase power. (8)

(ii) Explain brushless DC motor operation. (7)

Or

(b) (i) Explain the block diagram of DSO with list of functions performed by each block. (7)

(ii) Discuss any one speed control method for induction motors. (8)

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