Question Paper Code : **20185**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Second Semester

Electronics and Communication Engineering

BE 3254 – ELECTRICAL AND INSTRUMENTATION ENGINEERING

(Common to: Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define Voltage regulation.

2.   What are harmonics?

3.   What happens during generator mode of operation?

4.   What are universal motor?

5.   Name any two starting methods for induction motor.

6.   What are synchronous motor?

7.   How does moving Iron meter differ from moving coil meter?

8.   Mention two important features of DSO over CRO.

9.   What is the need for Earthing?

10. Write the function performed by circuit breaker.

PART B — (5 × 13 = 65 marks)

11. (a)   Explain in detail with equivalent circuit and phasor diagram the operation of transformer.

Or

     (b)   (i)   Write short notes on causes and method to minimize harmonics.   (6)

           (ii) Explain the functioning of autotransformer.   (7)

12. (a) With circuit model, obtain the EMF and torque equation of DC motor.

Or

(b) With circuit model and relevant timing diagram, explain the functioning of stepper motor.

13. (a) Explain the principle of operation of single phase induction motor with its characteristic curves.

Or

(b) Explain synchronous motor with its torque equation.

14. (a) (i) Explain in detail with block diagram, the function performed by every element of an instrument. (6)

(ii) Discuss the method to measure three phase power. (7)

Or

(b) Describe the digital storage oscilloscope with its internal diagram.

15. (a) Give an overview on power system structure with generation, transmission and distribution components.

Or

(b) (i) Discuss any one Earthing method. (6)

(ii) Give an overview on protective devices with short note on each type. (7)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Discuss the speed control scheme for DC motor. (7)

(ii) Obtain the induced EMF and voltage regulation expression of an alternator. (8)

Or

(b) (i) Draw the block diagram and explain the functions performed by each component of a data acquisition system. (10)

(ii) Highlight the significant features of brushless DC motor. (5)

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