Reg. No. :

Question Paper Code : 411129

B.E./B.Tech. DEGREE EXAMINATIONS November/December 2024

First and Second Semester

Electronics and Communication Engineering

GE23113/GE23211 – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to : Computer Science and Engineering /Computer and Communication Engineering / Artificial Intelligence and Machine Learning / Artificial Intelligence and Data Science / Computer Science and Business System)

(Regulations 2023)

Time : Three Hours | Maximum : 100 Marks

Answer ALL Questions

PART A — (10x2=20 Marks)

1. Define RMS (Root Mean Square) value of an AC signal.
2. A 20 V battery is connected to two resistors of 4Ω and 6Ω in parallel, find the total current supplied by the battery.
3. What is the difference between internal and external characteristics of a DC generator?
4. State the EMF equation of a single phase transformer.
5. What is the role of the rotor in a 3Ø squirrel cage induction motor?
6. Why is a capacitor used in the starting of single phase induction motor?
7. What is an IGBT and where it is used?
8. Convert the binary number 01101_2 to the octal number system.
9. Why calibration is important in measuring equipments?
10. What are the advantages of using a DSO over an analog oscilloscope?

PART B — (5x13= 65 Marks)

11. (a) Find the current in 8Ω resistor in the circuit shown in Fig. 11(a) using mesh analysis.

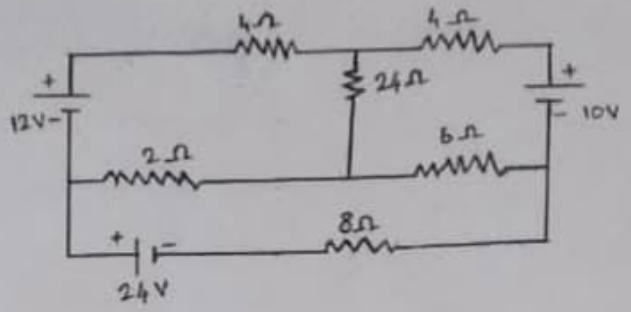

Fig. 11(a)

Or

(b) Write short notes about

i) Kirchoff's current law (3)

ii)Average value of a sinusoidal waveform (3)

iii) Instantaneous power in an AC circuit (3)

iv) Power factor in an AC circuit (2)

v) Reactive power in an AC circuit (2)

12. (a) Illustrate the construction and working principle of the DC Generator with a neat sketch.

Or

(b) Explain the construction and working principle of the single phase transformer with a neat sketch.

13. (a) Summarize the construction and working principle of the three-phase squirrel cage induction motor with a neat sketch.

Or

(b) Brief about the single-phase capacitor start induction motor with a neat sketch and list the types of single phase induction motor.

14. (a) Explain the working principle of an IGBT. Discuss its construction, operation and how it combines the advantages of both MOSFET and BJT.

Or

(b) Explain the working principle of a PN junction diode, discuss the behavior of the diode under forward bias and reverse bias condition.

15. (a) Demonstrate the working principle and operation of Moving Iron Repulsion type Instrument with a neat sketch.

Or

(b) Draw and explain the block diagram of the Digital Storage Oscilloscope and list the advantages and application of DSO.

PART C — (1x15=15 Marks)

16. (a) Explain the working principle of Permanent Magnet Moving Coil and mention its advantages and disadvantages.

Or

(b) Draw the block diagram of Data Acquisition system and state the function of each block and also list its application.
