Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 53127

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Mechanical Engineering

GE 6252 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to All Branches)

(Regulation 2013)

(Also Common to PTGE 6252 — Basic Electrical and Electronics Engineering for B.E. (Part Time) First Semester – Mechanical Engineering – (Regulation – 2014)

Time : Three hours   Maximum : 100 marks
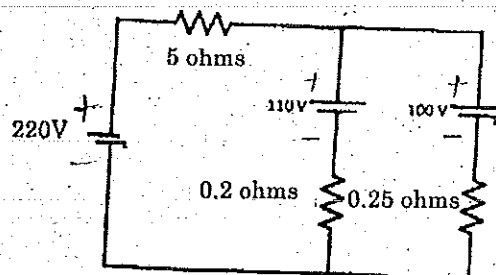
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Ohm's Law.

2. Compare the Moving Coil and Moving Iron instruments.

3. Sketch the OCC of DC shunt generator.

4. Write down the EMF equation of a transformer.

5. What do you mean by biasing?

6. Define α and β.

7. Convert $(634)_8$ to binary.

8. Which gates are called as the universal gates? What are its advantages?

9. Define analog and digital signals.

10. What are the advantages of Optical Fibre Communication?

PART B — (5 × 16 = 80 marks)

11. (a) (i) For the circuit given below, calculate the magnitude and direction of current in each battery and the total current taken from the 220 V supply mains. (12)

(ii)   A coil takes a current of 6A when connected to a 24 V DC supply. To obtain the same current with a 50Hz AC. supply, the voltage required is 30 V. Calculate

(1)   the inductance of the coil and

(2)   the power factor of the coil   (4)

Or

(b)   Explain the construction and working of a Dynamometer type watt meter. Mention its merits and demerits.   (12 + 4)

12.   (a)   With a neat sketch, explain the working principle of DC motor. Also derive the torque and speed equation.   (16)

Or

(b)   (i)   Explain the working of a single phase induction motor.   (8)

(ii)   Explain the construction details of single phase transformer.   (8)

13.   (a)   (i)   Explain V-I characteristics of zener diode and applications with necessary diagrams.   (8)

(ii)   Explain the operation of full wave rectifier with necessary diagrams.   (8)

Or

(b)   Explain how you will obtain the static characteristics of common emitter configuration.

14.   (a)   (i)   Prove the following Boolean identity

$$ABC + AB\overline{C} + \overline{A}B\overline{C} = B\left(A + \overline{C}\right).$$ (4)

(ii)   Draw the full adder circuit. Explain the operation with Truth Table and Boolean expression.   (12)

Or

(b)   With a neat diagram, explain the working of binary ladder network for digital to analog conversion.   (16)

15.   (a)   Describe the functional block diagram of Monochrome TV transmitter and receiver with neat sketch.

Or

(b)   Describe the principle of Amplitude and frequency modulation and its needs.

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