Question Paper Code : 73641

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Second Semester

Civil Engineering

GE 2151/EE 26/EE 1153/080280011/10133 EE 206 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Aeronautical, Automobile, Marine, Mechanical, Production, Chemical, Petroleum Engineering, Biotechnology, Polymer, Textile, Textile (Fashion), Plastic Technology, Environmental Engineering, Geoinformatics Engineering, Industrial Engineering, Industrial Engineering and Management, Manufacturing Engineering, Materials Science and Engineering, Mechanical and Automation Engineering, Mechatronics Engineering, Petrochemical Engineering, Chemical and Electrochemical Engineering, Petrochemical Technology, Pharmaceutical Technology and Textile Chemistry)

(Regulations 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A 120 Ω resistor has a specified maximum power dissipation of 1 W. Calculate the maximum current level.

2. Three inductive coils each with resistance of 15 Ω and an inductance of 0.03 H are connected in star to a 3ϕ 400 V, 50 Hz supply. Calculate the phase voltages.

3. An 8 pole, lap wound armature rotated at 350 rpm is required to generate 260 V. The useful flux/pole is 0.05 Wb. If the armature has 120 slots, calculate the number of conductors per slot.

4. What is the significance of back emf?

5. Give the applications of Zener Diode.

6. What are the different modes of Transistor operation?

7. Define Flip flop. What are the different types of flip-flop?

8. What are Registers?

9. Sketch the block diagram of FM Receiver.

10. Define Modulation Index.

PART B — (5 × 16 = 80 marks)

11. (a) (i) (1) State and explain Kirchoff's laws. (4)

    (2) A sinusoidal current wave is given by $i = 50 \sin(100\pi t)$. Determine the root mean square value. (4)

    (ii) Write short notes on moving Iron Measuring Instruments under the following headings :

    (1) Operating principle. (4)

    (2) Classification. (2)

    (3) Advantages and disadvantages. (2)

Or

(b) (i) 3ϕ, 200 kW, 50 Hz delta connected induction motor is supplied from a 3ϕ, 440 V, 50 Hz supply system. The efficiency and power factor of 3ϕ induction motor are 91% and 0.86 respectively. Calculate :

    (1) (A) Current in each motor phase (2)

        (B) Line current. (2)

    (2) Phasor diagram of the circuit. (4)

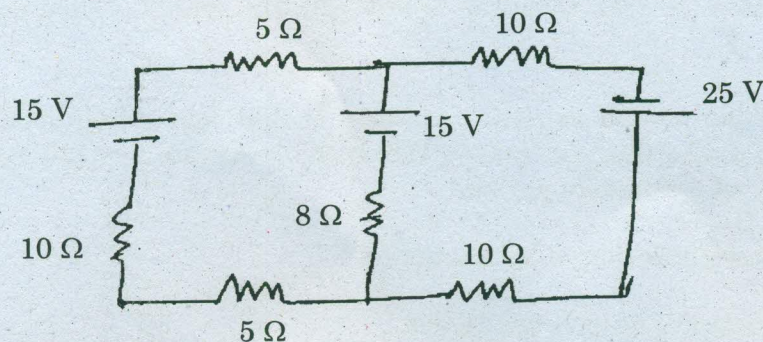   (ii) Find the current in the $8\,\Omega$ resistor in the following circuit using Kirchoff's laws. (8)

Figure 11(b) (ii)

12. (a) A 220-V D.C. series motor runs at 700 rpm when operating at its full-load current of 20 A. The motor resistance is 0.5 Ω and the magnetic circuit may be assumed unsaturated. What will be the speed if :

   (i) Load torque is increased by 44%?

   (ii) Motor current is 10 A?

   (iii) Explain the operation and principle of a DC motor.

Or

(b) Explain the construction of single phase transformer.

13. (a) Describe the working of a PN junction diode with neat diagrams. Also explain its V-I characteristics. (16)

Or

(b) Explain the working of the CB configuration of a BJT. (16)

14. (a) Explain in detail about D Flip-Flop, T – Flip-Flop and JK Flip-Flop. (16)

Or

(b) Explain the working of Half Adder and Full Adder using Truth table. (16)

15. (a) Explain the types of analog modulation with neat diagram. (16)

Or

(b) Explain in detail with necessary block diagram, the microwave and satellite communication systems. (16)

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