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Question Paper Code : 80220

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Second Semester

Computer Science and Engineering

BE 3251 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to : Aeronautical Engineering/Aerospace Engineering/Automobile Engineering/Biomedical Engineering/Computer Science and Design/Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer Science and Engineering (Data Science)/Computer and Communication Engineering/Industrial Engineering/Industrial Engineering and Management/Manufacturing Engineering/Marine Engineering/Materials Science and Engineering/Mechanical Engineering/Mechanical Engineering (Sandwich)/Mechanical Engineering (Specialised in Automobile)/Mechanical Engineering (Specialised in Smart Manufacturing)/ Medical Electronics/Production Engineering/Safety and Fire Engineering/Artificial Intelligence and Data Science/Computer Science and Business Systems/Information Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchhoff's Voltage law.
2. Define RMS value of an alternating parameter.
3. What is meant by self-excitation in DC machines? Mention the types of self-excitation.
4. Mention the voltage rating of distribution transformers used in India.
5. What do you mean by donor and acceptor impurity atoms?
6. Draw the V-I characteristic of SCR.
7. Convert the decimal number 185 into its binary equivalent.

8. Give an example logic equation and its circuit for Product of Sums (POS) method.
9. List the elements of a measuring instrumentation system and state their main functionality.
10. What is the use of current transformer and potential transformer?

PART B — ($5 \times 13 = 65$ marks)

11. (a) In the circuit shown in Figure Q11, determine the mesh currents i_1, i_2, i_3 .

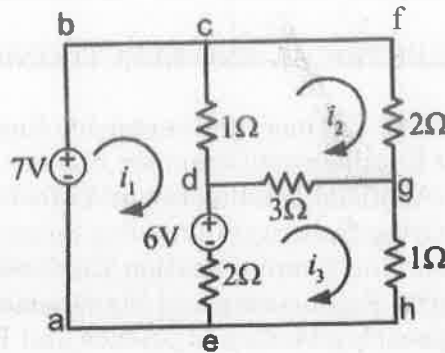


Figure Q11

Or

- (b) A series RLC circuit containing a resistance of 12Ω , an inductance of 0.15H and a capacitor of $100\text{ }\mu\text{F}$ are connected in series across a 100 V , 50 Hz supply. Calculate the total circuit impedance, the circuits current, power factor and draw the voltage phasor diagram.
 12. (a) Describe the constructional details and working principle of DC motors with neat diagram.
- Or
- (b) Describe the constructional details and working principle of three phase induction motors with neat sketch.
 13. (a) Explain working of Bipolar junction transistor. Explain the input and output characteristics of Bipolar junction transistor in common emitter configuration.

Or

- (b) Explain the operation of full wave diode bridge rectifier with its circuit and required waveforms.

14. (a) Explain the concept of longitudinal and cycling redundancy check error detection methods.

Or

- (b) A hamming code 0110001 is being received. Find the correct code which is being transmitted.
15. (a) Explain the working principle of permanent magnet moving coil ammeter. Derive the torque equation.

Or

- (b) Explain construction and working of single phase induction type energy meter with neat sketch.

PART C — (1 × 15 = 15 marks)

16. (a) Reduce the following Boolean function using 4-variable K-map
 $f(A,B,C,D) = \sum m(0,1,2,5,8,10,11,13,14,15)$.

Or

- (b) Design a 4 bit multiplexer from its truth table. Implement 16 bit multiplexer using 8 bit and 2 bit multiplexer.
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