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**Question Paper Code : 30064**

B.E./B.Tech DEGREE EXAMINATIONS, APRIL/MAY 2023.

Second Semester

Civil Engineering

BE 3252 – BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION  
ENGINEERING

(Common to: Environmental Engineering/Geoinformatics Engineering/  
Petrochemical Engineering/Agricultural Engineering/Bio Technology/  
Biotechnology and Biochemical Engineering/Chemical Engineering/ Chemical and  
Electrochemical Engineering/Fashion Technology/Food Technology/Handloom and  
Textile Technology/Petrochemical Technology/  
Petroleum Engineering/Pharmaceutical Technology/Plastic Technology/  
Textile Chemistry/Textile Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the symbol of conductor, resistor, inductor and capacitor.
2. What are the different types of AC power?
3. List the electrical accessories used in domestic wiring system.
4. Bring out the safety precautions to be observed in the installation of electrical appliances.
5. What is the difference between a motor and a generator?
6. Briefly explain the working principle of a transformer.
7. What is the barrier potential of silicon and germanium semiconductor material?
8. Draw the symbol of SCR and MOSFET.
9. Define mechatronics.
10. Name any one sensor and valve used in industrial applications.

PART B — (5 × 13 = 65 marks)

11. (a) What is the role of conductor, resistor, inductor and capacitor in electrical circuits? Explain with typical example for each. (3+3+3+4)

Or

- (b) Explain star and delta connection of three-phase power system with neat sketch. (6+7)

12. (a) Write short notes on the following: (4+4+5)

- (i) Magneto motive force.
- (ii) Flux density.
- (iii) Circuit breaker.

Or

- (b) Draw a simple wiring layout for domestic house hold appliances with necessary electrical accessories and distribution power points. (7+6)

13. (a) Draw the construction and working principle of DC motor. (7+6)

Or

- (b) Distinguish between three-phase induction motor and synchronous motor with their construction and working principle. (7+6)

14. (a) Draw and explain the volt-ampere characteristics of Zener diode and bipolar junction transistor. (6+7)

Or

- (b) Draw and explain full-wave rectifier circuit without filter and its input-output waveforms. (7+6)

15. (a) Explain the role of sensor and transducer in industrial application with typical example for each. (6+7)

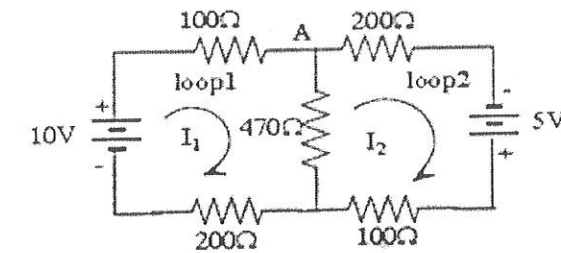
Or

- (b) Write short notes on the following: (4+4+5)

- (i) Actuator
- (ii) Limit switch
- (iii) LVDT

PART C — (1 × 15 = 15 marks)

16. (a) Verify Kirchhoff's current law and voltage law for the circuit given below. (8+7)



Or

- (b) Determine the theoretical phase angle of RLC series circuit shown below and verify with its phasor diagram. Given:  $R = 1000 \Omega$ ,  $L = 1 \text{ H}$ ,  $C = 0.1 \mu\text{F}$ ,  $f = 2 \text{ KHz}$  and  $V_m = 2 \text{ Vpp}$ . (8+7)

