

Reg. No. :

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**Question Paper Code : 20183**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 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 and Textile Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How inductors and capacitors are connected in the electrical circuit?
2. What is meant by star-delta connection of a transformer?
3. Define magnetic field intensity.
4. List the items provided in the first-aid box.
5. Write EMF equation of a DC generator.
6. Name any two types of transformers.
7. When semi-conductor device will conduct?
8. Give any one name of unipolar and bipolar device.
9. Distinguish between sensor and actuator.
10. Expand LVDT and DPT.

## PART B — (5 × 13 = 65 marks)

11. (a) Verify Kirchoff's voltage law and current law with typical circuit example. (6+7)

Or

- (b) Draw series RLC circuit and determine its parameters for  $R = 1000 \, \Omega$ ,  $L = 0.1H$ ,  $C = 0.01 \, \text{mfd}$ ,  $F = 1 \, \text{kHz}$  and  $V_m = 2V_{pp}$ . (6+7)

12. (a) Write short notes on the followings: (4+4+5)
- (i) Magnetic field intensity,
  - (ii) Mutual inductance,
  - (iii) Importance of earthing.

Or

- (b) (i) What are the accessories needed for a domestic house wiring.  
(ii) Briefly explain any two circuit breakers used in wiring. (5+4+4)

13. (a) Explain with neat diagram the construction and the working principle of separately excited DC generator. (7+6)

Or

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

14. (a) Draw and explain volt-ampere characteristics of PN junction diode and silicon controlled rectifier. (6+7)

Or

- (b) Which biasing is best suitable for bipolar junction transistor amplifier? Explain the same with the circuit. (2+11)

15. (a) Write short notes on the followings: (4+4+5)
- (i) Solenoid.
  - (ii) Proximity sensor.
  - (iii) Optical transducer.

Or

- (b) Write short notes on the followings: (4+4+5)
- (i) Photo sensor.
  - (ii) Hall effect.
  - (iii) Strain gauge.

## PART C — (1 × 15 = 15 marks)

16. (a) Estimate the cost of single-phase domestic house wiring system with the electrical layout of your own choice. (7+8)

Or

- (b) Draw application oriented electronic circuit which incorporates resistor, inductor and capacitor and explain their functions. (5+5+5)