

Reg. No. :

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)