



C14-EC-105

4038

**BOARD DIPLOMA EXAMINATION, (C-14)
SEPTEMBER/OCTOBER - 2020
DECE—FIRST YEAR EXAMINATION**

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 hours]

[*Total Marks* : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State four laws of resistance.
2. Define magnetic field intensity, magnetic potential and magnetic flux.
3. State Coulomb's law of electrostatics.
4. Define watt-hour efficiency of the cell.
5. Define average value, RMS value and peak factor for sine wave.
6. Classify the types of resistors.
7. List three metals used for fuses.
8. Give the standard specification for PCB.
9. Explain the term doping in semiconductors.
10. Define voltage regulation.

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11.** An immersion heater rated at 3 kW is used to heat copper tank weighing 20 kg and holding 120 liters of water. How long will it take to raise the temperature of the water from 10 °C to 60 °C if 20 percent of the energy supplied is wasted in heat losses? Assume specific heat of copper = 0.095, $j=4.2$ joules/calorie. 10
- 12.** (a) Explain work law and its applications. 5
(b) Draw and explain the electrical characteristics of lead-acid cell. 5
- 13.** Explain charging and discharging of capacitor.
- 14.** Calculate the impedance, power, current, phase angle and power factor in RC series circuits.
- 15.** (a) List the specifications of a capacitor. 5
(b) Explain the terms stray inductance and stray capacitance. 5
- 16.** Explain the working of toggle and push button switches.
- 17.** (a) List the steps involved in screen-printing for making PCBs. 5
(b) Describe the formation and working of Zener diode. 5
- 18.** Describe the working of bridge rectifier circuit with waveforms.

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