



C14-EC-105

4038

BOARD OF DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

DECE - FIRST YEAR EXAMINATION

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Time : 3 Hours]

[Total Marks : 80

PART - A

4×10=40

- Instructions :**
- (1) Answer **ALL** questions.
 - (2) Each question carries **FOUR** marks (Two marks for each bit).
 - (3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

- 1 (a) State Ohm's Law.
(b) Mention two merits of CFL and LED lamps over Incandescent lamps from power consumption point of view.
- 2 (a) State Coulombs laws of magnetism.
(b) Compare magnetic circuit with electric circuit.
- 3 (a) Define Electrostatic field intensity.
(b) List the factors affecting the capacitance of a parallel plate capacitor.
- 4 (a) Give any two applications of Lead-acid batteries.
(b) Define the Ampere hour and Watt hour efficiencies of the cell.
- 5 (a) Define the RMS value for a sine wave.
(b) Define Q factor of a coil.

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- 6 (a) List the specifications of a resistor.
 (b) Compare the features of carbon and wire wound potentiometers.
- 7 (a) Classify the switches according to poles and throws.
 (b) Explain the need for connectors in electronic circuits.
- 8 (a) Mention the methods of layout preparation of PCB.
 (b) Give the standard specifications for PCB.
- 9 (a) Sketch the energy band diagrams for conductors and semiconductors.
 (b) Distinguish between drift and diffusion current.
- 10 (a) State the necessity of DC power supply for electronic circuits.
 (b) Define voltage regulation.

PART - B**10×4=40**

Instructions :

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

- 11 (a) Derive the expression for equivalent resistance of the parallel connection of resistors. **4**
- (b) A residential house has the following loads : **6**
- (i) 10 lamps of 60W, working for 8 hours/day
 - (ii) 5 fans of 80W, working 12 hours/day
 - (iii) 2 heaters of 1000W, working 3 hours/day
- Calculate the monthly electricity bill at the rate of Rs. 1.35 for the first 50 units and Rs. 2.15 for the remaining units. Add Rs. 20 as a meter rent per month.

- 12 (a) Explain the charging and discharging of capacitor for DC with the help of neat circuit diagrams. 6
- (b) Two capacitors of $20\mu\text{F}$ and $30\mu\text{F}$ are connected in parallel across a 200 volts supply. Determine the total energy supplied by the source. 4
- 13 (a) Draw and explain the magnetic field patterns due to
- (i) Straight current carrying conductor
- (ii) Solenoid 5
- (b) Explain the chemical reactions that take place during charging and discharging of lead - acid battery. 5
- 14 (a) Explain the effect of AC flowing through pure resistance. 5
- (b) Calculate the impedance in RLC series circuit. 5
- 15 (a) List any four applications of AF and RF chokes. 4
- (b) Give the constructional details of LDR (Light Dependent Resistor). 6
- 16 (a) Classify different relays based on the principle of operation, polarization and application. 5
- (b) Explain the working of Toggle switch with neat diagram. 5
- 17 (a) Explain the use of Surface Mount Technology (SMT). 5
- (b) Describe the working of PN junction diode under :
- (1) No bias (2) Forward bias and (3) Reverse bias conditions. 5
- 18 (a) Describe the working of Halfwave rectifier with waveforms. 5
- (b) Explain the working of a simple Zener regulated DC power supply. 5