C-16S-EC-106

5145

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH / APRIL - 2019

DECE - I SEMESTER EXAMINATION

BASIC OF ELECTRICAL ENGINEERING

Time : 3 Hours] [Total Marks : 80

PART - A 2×15=30

Instructions : *(1) Answer any 15 questions.*
(2) Each question carries 2 marks.
(3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1 State Ohm's law.

2 Write the formula for power and mention its units.

3 List the four effects of electric current.

4 Mention any two practical applications of electric heating.

5 Define flux and flux density.

6 State Coulomb's laws of magnetism.

7 Define ampere.

8 Give the equation for energy stored per unit volume in a magnetic field.

9 Define absolute and relative permittivity.

10 Define primary and secondary cell.

11 List any four merits of lithium ion batteries.

12 List any four important applications of lead acid batteries.

13 Define time period and amplitude of a sine wave.

14 Write any one form of emf equation.

15 Define RMS value.

16 Draw the vector diagrams of sine waves of same frequency.

17 State any two general electrical safety rules.

18 Draw any two safety symbols and write their meaning.

19 Write any two causes of fire in industry.

20 List four types of portable fire extinguishers.

PART - B 10×5=50

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

21 (a) Deduce the relation $R = \rho \frac{l}{a}$.

(b) A copper coil has a resistance of 12.7 Ω at 10° C and 14.3Ω at 50°C. Find the (i) temperature coefficient of resistance at 0°C and (ii) resistance of the coil at 0°C.

22 A house has the following load :

(a) 10 lamps of 60W each working for 10 hours a day.

(b) 1 electric iron of 450W working for 1 hour a day.

(c) 8 fans of 80W each working for 12 hours a day.

(d) 1 heater of 1000W working for 1 hour a day.

(e) 1 refrigerator of 250W working for 12 hours a day.

Calculate the monthly bill if rate of charge per unit is Rs. 1.20 plus Rs. 20 as meter rent for the month of June.

23 Compare magnetic circuit with electric circuit.

24 Draw and explain the field pattern due to straight current carrying conductor.

25 Explain the constructional details of lead acid battery and the chemical reactions that take place during charging and discharging.

26 Explain the concept of 'leading, lagging and in-phase with the help of waveforms.

27 (a) An alternating current is represented by $i = 70.7 \sin 520t$. Determine (i) maximum current (ii) frequency and (iii) time period.

(b) Add the following currents as waves and as vectors $i_1 = 7 \sin wt$ and $i_2 = 10 \sin (wt + \pi/3)$ and find the resultant current.

28 Explain the method of first aid treatment for someone suffering from electric shock.