



C14-EE-106

**4046**

**BOARD DIPLOMA EXAMINATION, (C-14)  
SEPTEMBER/OCTOBER - 2020  
DEEE—FIRST YEAR EXAMINATION  
BASIC ELECTRICAL ENGINEERING**

Time : 3 hours ]

[ Total Marks : 80

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**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. Define the following terms :

- (a) Potential difference
- (b) EMF

2. State Ohm's law and give the equation with units.

3. Define thermal efficiency.

4. State Joule's law of electric heating.

5. Define the following terms :

- (a) Magnetic flux
- (b) Magnetic flux density

6. State Biot-Savart law.

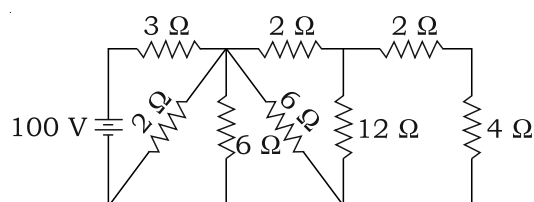
- \* 7. State Fleming's right-hand rule.
8. Find the area required for such an electromagnet to have a lifting power of 400 kg with a flux density of 0.1 weber/sq. meter.
9. Define the following :
- Electric flux
  - Electric flux density
  - Electric field intensity
10. Define capacitance and state its units.

**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. (a) Derive the formula for equivalent resistance of three resistances in parallel. 5  
 (b) The resistance of a conductor at 10 °C is 5 ohm and at 100 °C is 12 ohm. Find the resistance at 0 °C and also find temperature coefficient at 40 °C. 5
12. Find the total current  $I$  in the given circuit : 10



- \* **13.** A household has the following load :
- (a) 10 lamps of 60 W each, working for 10 hours a day
  - (b) 1 electric iron of 450 W, working for 1 hour a day
  - (c) 8 fans of 80 W each, working for 12 hours a day
  - (d) 1 heater of 1000 W, working for 1 hour a day
  - (e) 1 refrigerator 250 W, working for 12 hours a day
- Calculate the monthly bill, if the rate of charge per unit is ₹ 1.20 plus ₹ 20 as meter rent. 10
- 14.** An electric kettle is rated 1.5 kW, 230 V takes 5 minutes to bring 1 kg of water to boiling point from 150 °C. Find the efficiency of the kettle. 10
- 15.** (a) Explain work law and its applications. 5
- (b) Derive an expression for force between two parallel current-carrying conductors. 5
- 16.** (a) State Faraday's laws of electromagnetic induction. 5
- (b) Compare an electric circuit with a magnetic circuit in any five aspects. 5
- 17.** (a) Derive an expression for lifting power of a magnet. 5
- (b) An inductor with 10 Ω resistance and 200 mH inductance is connected to 24 V d.c. supply. Calculate the energy stored in the inductance and power absorbed. 5
- 18.** (a) Derive an expression for energy stored in a capacitor. 5
- (b) Three capacitors 20 mF; 40 mF and 100 mF are connected in (i) series, (ii) parallel across a 400 V supply. Find the energy stored in each case. 5

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