



C16-EC—106

**5030**

**BOARD DIPLOMA EXAMINATION, (C-16)**

**MARCH/APRIL—2018**

**DECE—FIRST YEAR EXAMINATION**

**BASIC ELECTRICAL ENGINEERING**

*Time : 3 hours ]*

*[ Total Marks : 80*

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**PART—A**

2×15=30

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

1. State Ohm's law.
- \* 2. Calculate the effective resistance when two resistances 20 ohm and 40 ohm are connected in parallel.
3. List the power ratings of any four home appliances.
4. Define electric energy.
5. Distinguish between magnetic circuit and electric circuit (any four).
6. Define frequency and mention its unit.
7. A resistance of 9 ohm is connected in series with an inductive reactance of 12 ohm connected across a.c. supply. Determine the power factor.
8. Define form factor.

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9. Compare between series and parallel resonant circuit (any four).
10. Define apparent power and mention its unit.
11. Convert the following rectangular to polar :
- (a)  $6 - j8$
- (b)  $3 + j4$
12. What are the advantages of 3-phase system over 1-phase system?
13. Write the 3-phase power equation.
14. List the different types of power plants.
15. Define line voltage.
16. List the applications of soda-acid fire extinguisher.
17. Define Lenz's law.
18. Write the applications of synchronous motor.
19. List the different types of fire accidents in industry.
20. Write any four precautions to be taken to prevent fire accidents.

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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.

21. (a) Derive an expression for conversion of electrical energy into equivalent heat energy in kilo-calories.  
 (b) Define thermal efficiency and write its equation. 6+4=10
22. Derive an expression for energy stored in magnetic field. 10

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- 23.** (a) \* Explain the constant voltage system of charging battery.  
 (b) Write the advantages and disadvantages of constant voltage charging system. 6+4=10
- 24.** Explain the chemical reaction that takes place during charging and discharging of lead-acid battery.
- 25.** A resistance of 50 ohms, inductive of 100 millihenry and a capacitance of 100 microfarad are connected in series across 200 volts and 50 Hz supply. Determine the following : 2×5=10
- (a) Inductive reactance  
 (b) Capacitive reactance  
 (c) Impedance  
 (d) Current  
 (e) Power
- 26.** (a) Derive an expression for resonant frequency in *R-L-C* series circuit.  
 (b) A coil of resistance 2 and inductance 0.01 H is connected in series with capacitor across 200 V and 50 Hz supply. What must be the capacitance in order that maximum current occurs? 6+4=10
- \* **27.** Derive the EMF equation of DC generator. 10
- 28.** Explain the principle and operation of a 3-phase induction motor. 10

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