



C16-EC-106

5145

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2018

DECE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours]

[Total Marks : 80

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. Define the terms 'electric current' and write its units.
- * 2. What are the factors affecting the resistance of a resistors?
3. Define thermal efficiency.
4. List the four effects of electric current.
5. Define magnetic field intensity and write its units.
6. Define reluctance and flux.
7. Define the terms 'leakage flux' and 'leakage coefficient'.
8. List Works law applications.
9. Define Faraday's laws of electrolysis.

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10. Define ^{*} primary and secondary cells and give examples.
11. Define ampere-hour.
12. List the applications of lead, acid batteries.
13. Define (a) time period and (b) frequency.
14. Draw the vector diagram of AC voltage and AC current wave.
15. Define average value.
16. Define phase and phase difference.
17. List major hazards arising from the use of electrical equipment.
18. Draw any two safety symbols.
19. List four types of portable fire extinguishers.
20. What is the procedure to remove victim from supply in case of electric shock?

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PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

21. (a) State Ohm's law and mention its limitations. 5
(b) Mention the merits of CFL and LED lamps over incandescent lamps from power consumption point of view. 5
22. Derive the expression for equivalent resistance in series circuit. 10
23. (a) State and explain Coulomb's law of magnetism. 5
(b) Explain the toroid with neat sketch. 5

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- 24.** (a) ^{*} Compare magnetic circuit with electric circuit. 5
 (b) Derive the expression for energy stored in a magnetic field. 5
- 25.** Explain the chemical reactions that take place during charging and discharging of lead-acid cells. 10
- 26.** (a) Define (i) peak factor and (ii) form factor. 5
 (b) A voltage of $V = 20 \sin(314t - 60)$ is applied to a circuit. Calculate (i) amplitude, (ii) angular frequency, (iii) frequency, (iv) time period and (v) phase. 5
- 27.** Three currents represented by $i_1 = 20 \sin t$, $i_2 = 30 \sin(t/4)$ and $i_3 = 40 \cos(t/6)$ act together in a circuit. Find the resultant current equation in the standard form. 10
- 28.** (a) State general electrical safety rules. 5
 (b) Explain the causes of fire and fire accidents in industry. 5

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