C14–EC–**105**

4038

BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2016

DECE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 hours]   [*Total Marks* : 80

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 resistance. What are the factors that affect the resistance of a material?

2. Define Coulomb's laws of magnetism.

3. Define absolute and relative permittivity.

4. List the advantages of secondary cells over primary cells.

5. Define RMS value and average value of sine wave.

6. What is the need for tapering in potentiometer?

7. Draw the ISI symbols of SPST, SPDT, DPST and DPDT switches.

8. What are different materials used in screen printing?

9. Write the difference between drift current and diffusion current.

10. Draw the block diagram of a regulated power supply.

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 an expression for the resistance of three resistors that are connected in parallel.   6

(b) What is the total resistance of a resistive network with two resistors of value 5 k and 500 connected in series?   4

12. *(a)* Derive an expression for the energy stored in a magnetic field.   5

(b) Explain briefly the constructional details of lithium ion batteries.   5

13. *(a)* Explain gauss theorem.   4

(b) Derive an expression for the capacitance of a parallel plate capacitor.   6

14. Derive an expression for the instantaneous power and average power of an inductor connected across an AC source.

15. *(a)* Explain the working of thermistor and sensistor.   7

(b) List out the applications of LDR.   3

16. *(a)* Write about the performance characteristics of a relay.   6

(b) List various contact materials used in relays.   4

17. *(a)* Explain the steps involved in screen printing in PCB preparation.   5

(b) Explain the working of *P-N* junction diode in forward bias and reverse bias.   5

18. Explain the working of a half-wave rectifier with wave forms.

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