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C16–EE–106

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BOARD DIPLOMA EXAMINATION, (C–16)

SEPTEMBER/OCTOBER - 2020

DEEE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL 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. State Ohm's law and give the equation.

2. Define temperature coefficient of resistance and state its unit.

3. Define work, power and energy.

4. State Joule's law of heat.

5. State right-hand thumb rule.

6. Define the following :

(a) MMF

(b) Flux

(c) Reluctance

7. Classify various types of induced e.m.fs.

8. State Fleming's right-hand rule.

9. Define capacitance and state its unit.

10. State Gauss theorem.

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)* State the effect of temperature on resistance. 3

(b) The resistance of copper winding of a motor at room temperature of 20 °C is 3 42 . After an extended operation of the motor at full load, the winding resistance increases to 4 22 . Find the temperature rise. Given that the temperature coefficient of copper at 0 °C is 0·00426/°C. 7

12. *(a)* Define *(i)* EMF and *(ii)* resistance. State their units. 4

(b) Derive an expression of equivalent resistance when three resistors are connected in parallel. 6

13. An industry is connected with the following loads :

(i) 10 fans of 60 W each working for 10 hours a day

(ii) 2 kW heater working for 6 hours a day

(iii) 1 oven of 1·5 kW working for 6 hours a day

(iv) 15 electric bulbs of 60 W each working for 4 hours a day

Calculate the electricity bill for the month of 30 days at the rate of 55 paise per unit.

14. Draw a neat sketch of electric iron and explain different parts.

15. *(a)* Compare electric and magnetic circuits in any five aspects. 5

(b) State Laplace law. 5

16. *(a)* State and explain Faraday's laws of electromagnetic induction. 7

(b) State Lenz's law. 3

17. *(a)* Derive the equation for energy stored in a magnetic field. 5

(b) A coil of 600 turns carrying a current of 10 A gives rise to a magnetic flux of 1 mWb. Calculate the energy stored in the coil. 5

18. *(a)* Derive the equivalent capacitance when two capacitors are connected in series. 5

(b) Define dielectric strength and dielectric constant. 5

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