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C09–EE–105

3037

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2018

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. Define the following terms based on valance electrons :

(a) Conductors

(b) Insulators

(c) Semiconductors

2. The resistance of a coil of wire increases from 40 at 10 °C to 48·25 at 60 °C. Find the temperature coefficient at 0 °C of the conductor.

3. Expand ACSR and AAA and give two applications.

4. Define permeability and reluctance.

5. State Fleming's right-hand rule.

6. Find the area required for such an electromagnet to have a lifting power of 400 kg with a flux density of 0·1 Wb/m^2.

7. State Gauss's theorem.

8. State the factors affecting insulating resistance.

9. State fuse and materials used for fuse.

10. Define intrinsic and extrinsic semiconductors.

PART—B

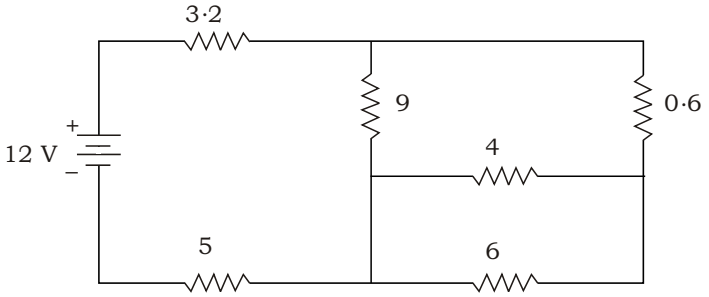
10×5=50

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

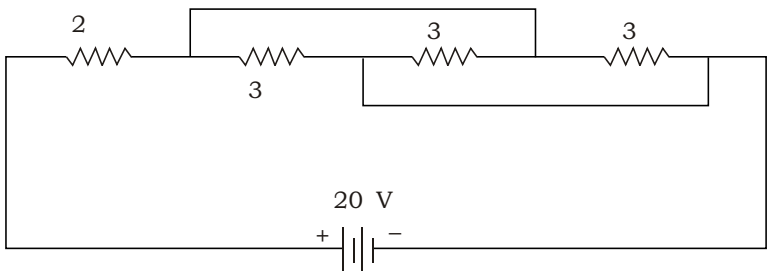
(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Calculate the total resistance and current in 5-ohm resistor. 5



(b) Calculate the value of current *I* supplied by the voltage source. 5



12. Draw and explain the working principle of an electric cooker.

13. Draw and explain hysteresis loop.

14. *(a)* Derive an expression for mutual inductance. 5

(b) If two identical coils have an equivalent inductance of 0·08 H and 0·035 H, when fluxes are aiding and opposing respectively, find the mutual inductance and coefficient of coupling. 5

15. *(a)* Plot the electrostatic field due to *(i)* isolated positive charge, *(ii)* isolated negative charge, *(iii)* two like charges side-by-side and *(iv)* two unlike charges side-by-side. 5

(b) Find the force of interaction between two charges spaced 10 cm apart in vacuum. Two charges are $4 \quad 10^{5}$ and $6 \quad 10^{8}$ coulombs respectively. If the same charges are separated by the same distance in kerosene, whose relative permittivity is 2, what is the corresponding force? 5

16. *(a)* State any five properties of impregnated paper. 5

(b) Mention the applications of mica. 5

17. *(a)* Write any five specifications of a junction diode. 5

(b) Write any five specifications of transistor. 5

18. *(a)* Write the properties of platinum. 5

(b) What are the common methods of impregnation? 5

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