3037

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BOARD DIPLOMA EXAMINATION, (C–09)

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. Show that R_t $R_1 R_2 / (R_1$ $R_2)$, when R_1 and R_2 are connected in parallel.

2. A coil wound of copper wire has a resistance of 16 ohm at 20 °C. Calculate its resistance at 60 °C, if the resistance temperature coefficient of copper is 0·0043/°C at 20 °C.

3. State the requirements of high-resistance material.

4. Define leakage flux and explain fringing effect.

5. Two identical coils A and B of 500 turns each line in parallel plane that 60% of flux produced by one coil link with the other. If a current of 5A flowing in coil A produces a flux of 0·05 mWb in it, find the mutual inductance between coils A and B.

6. Classify the induced emf's.

7. Two charges are placed in air, then find out the permittivity of the medium.

8. Write any three applications of PVC.

9. What are the advantages of impregnation?

10. Distinguish between P- and N-type 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)* Define Ohm's law. Write the limitations of Ohm's law.   6

(b) A voltage of 20 V is required to cause a current of 2A to flow in a resistor of resistance 10 . What voltage would be required to make the same current flow, if the resistance were 40 ?   4

12. *(a)* State and explain Joule's law of heating.   6

(b) Explain the four practical applications of electric kettle and space heater.   4

13. Draw and explain hysteresis loop.

14. *(a)* Derive an expression for lifting power of a magnet.   5

(b) A coil of 2000 turns is wound on a toroidal magnetic core having reluctance of 10^5 AT per Wb. When the coil current is 5A and is increased at a rate of 150 A/s, determine induced e.m.f. and energy stored.   5

15. Two capacitors having capacitances of 10 microfarad and 15 microfarad respectively are connected in series across a 200 V d.c. supply. Calculate—

(a) the charge on each capacitance;

(b) the potential difference across each capacitor;

(c) the energy stored in each capacitor.

16. Briefly explain the classification of the insulating materials based on temperature.

17. *(a)* Explain CB configuration of *N-P-N* transistor and sketch input and output characteristics of it.   6

     (b) Explain the construction of extrinsic SC.   4

18. *(a)* Write four examples of low- and high-resistivity materials.   6

     (b) Write short note on bi-metals and its applications.   4

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