C09–EE–**105**

3037

BOARD DIPLOMA EXAMINATION, (C–09)
MARCH/APRIL—2014
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 the laws of resistance.

2. Define work, power and energy.

3. Define annealing and hardening.

4. Define *(a)* flux density, *(b)* reluctance.

5. State the Faraday's laws of electromagnetic induction.

6. Derive the relation between L1, L2, M and K.

7. State the Coulomb's law of electrostatics.

8. List the various factors affecting the insulation resistance.

9. Classify special purpose materials.

10. Write any three differences between *p*-type and *n*-type semiconductors.

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. Find the current and power consumed by the 2 Ω resistor : 10
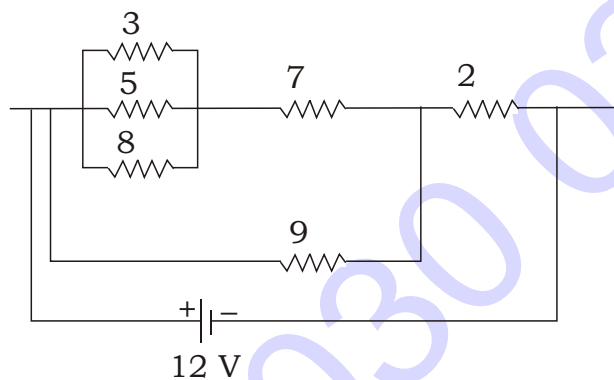
12. *(a)* List the properties of *(i)* manganin, *(ii)* nicrome.   5

(b) Explain the common methods of impregnation.   5

13. *(a)* Explain the Joule's law of electric heating.   4

(b) An electric kettle is marked 500 W, 230 V and is found to take 15 minutes to raise 1 kg of water from 15 °C to boiling point. Calculate the efficiency of kettle.   6

14. A circular iron ring 20 cm in diameter has an air-gap of 1 mm wide cut in it. The area of cross-section of the ring is 3·6 cm². Calculate the number if amp-turns needed to set up a flux of 0·5 milli weber in the air-gap. Neglect leakage and fringing.   10

15. *(a)* Two inductances of 40 mH and 80 mH are connected in series such that their fluxes are in the same direction. The coefficient of coupling is 0·8. Calculate *(i)* the total inductance of the combination, *(ii)* mutual inductance.   4

(b) Obtain the expression for lifting power of a magnet.   6

16. *(a)* Derive the expression for energy stored in a capacitor.   4

(b) Three capacitors 10 F, 25 F and 50 F connected in *(i)* series, *(ii)* parallel across a 400 V supply. Find the total energy stored in each case.   6

17. *(a)* Write the properties and applications of PVC.   6

(b) Explain two types of mica.   4

18. Explain *V-I* characteristics of *p-n* junction diode with neat sketch.   10

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