3037

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2016

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 :

   (a) Electrical work

   (b) Electrical power

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

3. Expand ACSR and AAC. Give two applications.

4. Define leakage flux. Explain fringing effect.

5. Two magnetically coupled coils have self-inductance 100 mH and 400 mH. If the coefficient of coupling is 0·8, find the value of mutual inductance between the coils.

6. A wire of length 40 cm moves at right angles to its length at 30 m/sec in uniform magnetic field of density 1 Wb/m^2. Calculate the e.m.f. induced in the conductor when the director of motion is *(a)* perpendicular to the field and *(b)* inclined at 60º to the direction of the field.

7. Define electric field intensity.

8. Write the three applications each of *(a)* impregnated paper and *(b)* mica.

9. Write the properties of fuse material.

10. Compare between intrinsic and extrinsic semiconductors.

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PART—B   10×5=50

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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)* Write the difference among conductor, semiconductor and insulator.

(b) A piece of silver has a resistance of 2 ohms. What will be the resistance of a manganium wire of 1/3 length and 1/3 diameter, if the specific resistance of the manganin is 30 times that of the silver?

12. *(a)* Draw and list the parts of electric kettle.

(b) An electric heater contains 4 litres of water initially at a mean temperature of 15 ºC, 0·25 kWh is supplied to the water by heater. Assuming no heat losses, what is the final temperature of the water?

13. A ring has mean diameter of 21 cm and cross-sectional area of 10 cm^2. The ring is made up of semicircular sections of cast iron and steel with each joint having reluctance equal to an air gap of 2 mm. Find amp-turns required to produce a flux of 8×10^{-4} Wb.
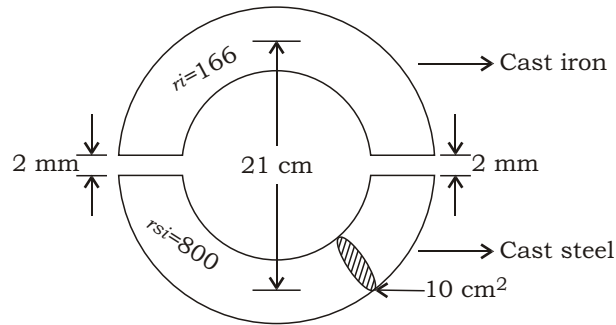
14. Two magnetically coupled coils have a mutual inductance of 32 mH. What is the average e.m.f. induced in one, if the current through the other changes from 3 mA to 15 mA in 0·004 sec? Given that one of the coils has twice the number of turns in the other, calculate the inductance of each coil. Neglect leakage factor.

15. (a) Give the relative permittivity values of the following dielectrics :   5
   (i) Air
   (ii) Bakelite
   (iii) Glass
   (iv) Transformer
   (v) Mica

   (b) Derive an expression for energy stored in a capacitor.   5

16. (a) Write any five properties of insulating materials.   5

   (b) Explain thermoplastic and thermosetting resins with example.   5

17. (a) Explain with neat sketch the operation of PNP transistor.   5

   (b) Compare between CB and CE configurations of a transistor.   5

18. (a) Write the properties of platinum.

   (b) Describe the varnish impregnation process with a neat sketch.

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