Total No. of printed pages = 3

CAI-405/EC&M/4th Sem/2013/N/C

ELECTRONICS COMPONENTS AND MATERIALS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) What are ferrites ? What is their composition and how are they classified ? Why are they preferred over conventional ferromagnetic core materials ? 2+1+1+2=6

   (b) Define ceramics. How are they classified ? Write some uses of ceramics. 2+2+4=8

2. (a) Discuss briefly the uses of carbon. Also mention the classification of natural graphite. 4+3=7

[Turn over

(b) Compare magnesium and manganese as special-purpose materials used in some industrial applications in the field of electronics. 7

3. (a) What are the different types of magnetism ? Compare each type of magnetism on the basis of their magnetic behaviour with suitable diagram. 2+5=7

(b) What do you mean by superconductivity ? Write any five applications of superconducting material. 2+5=7

4. (a) Mention any five advantages of carbon film resistor over metal-oxide resistors. 5

(b) Write any three physical properties of Nickel. Which isotope of nickel is most abundant ? Mention some applications of Nickel. 3+1+5=9

5. (a) A 10:1 step down transformer has a full-load secondary current of 20A. A short circuit test for copper loss at full-load gives a wattmeter reading of 100W. If $R_p = 0{\cdot}6W$, find the value of R_s ? 6

(b) Mention any two factors to which the self inductance (L) depend on. 2

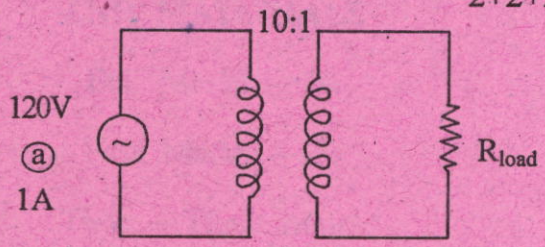
(c) Consider the following circuit and find :

(i) The voltage across R_{load}.

(ii) The current in the secondary.

(iii) Did the power remain the same ?

2+2+2=6



6. (a) What do you understand by electro-magnetic shielding ? Write the name of any four materials used for electro-magnetic shielding. 2+2=4

(b) Write any two chemical properties of Thorium. 2

(c) Write any four uses of Molybdenum. 4

(d) Write the difference between monolithic ICs an hybrid ICs. 4

7. Write short notes on : 7+7=14

(a) Losses in Transformers

(b) AF Transformer.