BCA First Semester Examination, Dec – 2019

SECOND PAPER

ELECTRICAL CIRCUIT & SEMICONDUCTOR PHYSICS

Paper Code:-42102

Time Allowed: Three Hours **Maximum Marks.70**

(1) No supplementary answer book will be given to any candidate. Hence the candidates should write the answers precisely in the main answer book only.

(2)All the parts of one question should be answered at one place in the answer book.

(Attempt all six questions.)

Part I (Question No. 1& 2) is compulsory & Part II (Question No. 3, 4 , 5 & 6) has internal choice.

Part-I

1. Answer any 10 questions. Each question carries 1 mark. 10x1= 10
(Words limit up to 20 words each)

a) What do you mean by conservation of charge?

b) Define Electric Potential.

c) State Coulomb's Law.

d) What is resistivity of conductors?

e) What is time constant of LR circuit?

f) What do you mean by Magnetic Flux?

g) What do you mean by Energy Bands?

h) What are Covalent Bonds?

i) Are N-type semiconductors electrically positive, negative or neutral?

j) What do you mean by Depletion Region?

k) Define Mobility of a charge carrier.

l) What is Zener Diode?

2. Answer all the questions. Each question carries 5 marks. 4x5 = 20
(Words limit up to 50 words each)

a) State Gauss's Law of Electrostatics.

b) Explain the magnetic energy stored in an inductor.

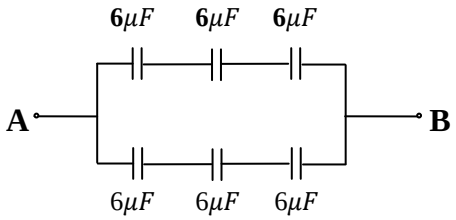
c) Differentiate between insulator, conductor and semiconductor on the basis of band theory.

d) Discuss extrinsic semi-conductors.

Part-II
Unit-I

3. (a) What is Electric Potential Energy? Derive an expression for potential energy of two charges separated by distance 'r'. **6**

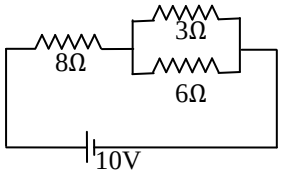
(b) Find the equivalent capacitance between A and B **4**



OR

(a) State Kirchoff's Current Law and Voltage Law and give example for each law. **6**

(b) Find the value of current in 3Ω resistance in the following circuit. **4**



Unit-II

4. (a) State Biot-Savart's Law. Derive an expression for magnetic field due to a current carrying coil at its centre. **6**

(b) The diameter of 200 turns circular coil is 20 m. Find the magnetic field at its centre when 3A current flows through it. **4**

OR

(a) Discuss Faraday's Law of electromagnetic induction and give example. **5**

(b) Distinguish between diamagnetic,paramagnetic and ferromagnetic materials. **5**

Unit-III

5. (a) Explain Intermolecular Forces. **5**

(b) Write two names each for acceptor and donor type impurities. **5**

OR

(a) Write the elementary properties of Germanium and Silicon semiconductors. **5**

(b) Discuss the process of conduction in semiconductors. **5**

Unit-IV

6. Describe the working of full wave rectifier and derive an expression for ripple factor. **10**

OR

What do you mean by Bipolar Transistor Action? Explain the basic principle of operation of open circuited transistor. **10**

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