BCA First Semester Examination, Dec-2018
SECOND PAPER
ELECTRICAL CIRCUIT & SEMICONDUCTOR PHYSICS
Paper Code:-1721

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 is the unit of electric charge?

    b) What is Electric Lines of Force?

    c) What is Conductivity?

    d) Define Magnetic Flux.

    e) What is Inductance?

    f) What are diamagnetic materials?

    g) What is electronic configuration of Si?

    h) What is the value of forbidden energy gap of Ge?

    i) What are minority charge carriers in P-type semiconductor?

    j) Draw notations for NPN transistors.

    k) What is the ripple factor of half wave rectifier?

    l) How is emitter-base junction of a transistor biased?

2. **Answer all the questions. Each question carries 5 marks.**   **4x5 = 20**
    (Words limit up to 50 words each)
    a) What do you mean by quantization and conservation of electric charges?
    b) State Faraday's Law of Electromagnetic Induction. .
    c) Explain the intermolecular forces.
    d) Draw circuit diagram for obtaining characteristic curves of PNP transistor in common emitter configuration.

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Part-II
Unit-I

3. (a) Explain the series and parallel combination of resistances. **6**

(b) Calculate the equivalent capacitance between P and Q. **4**
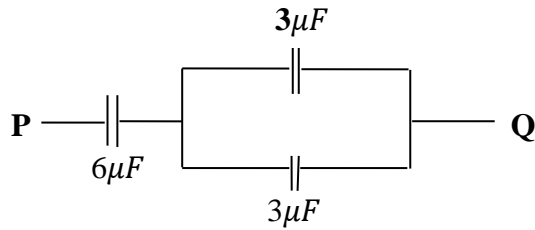
OR

State the following laws: **4x2.5**
(a) Gauss' Law of Electrostatics.
(b) Ohm's Law.
(c) Kirchoff's Current Law.
(d) Kirchoff's Voltage Law.

Unit-II

4. (a) State Biot-Savart's Law. Determine the magnetic field inside a long straight solonoid. **6**

(b) The radius of the coil having 100 turns is 20 cm. If current of 1.4 A flows through it, then find the magnetic field at its Centre. **4**

OR

(a) What is Toroid? Determine the magnetic field inside a toroid. **10**
(b) Determine the force between two parallel current carrying conductors.

Unit-III

5. What are Conduction Band, Valance Band and Forbidden Energy Gap in solids? On the basis of the concept of energy bands, classify the conductors, insulators and semiconductors. **10**

OR

What do you understand by Intrinsic and Extrinsic Semiconductors? Explain the effect of donor or acceptor type impurities in semiconductors. Name two donor and two acceptor type impurities. **10**

Unit-IV

6. What do you mean by Rectifiers? Explain the working of half wave rectifier and derive an expression for efficiency of it. **10**

OR

What do you mean by Depletion Region? Explain working of a Zener diode. How is it used in voltage regulation? **10**

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