2025/12

SET A

BACHELOR OF COMPUTER APPLICATION
FIRST SEMESTER
PRINCIPLES OF BASIC ELECTRONICS
BCA-MIN-911

[USE OMR FOR OBJECTIVE PART]

Duration: 2 hrs. **Full Marks: 50**

Objective

Time: 20 min. **Marks: 15**

Choose the correct answer from the following: *1X15=15*

1. In a P-type semiconductor, the majority carriers are
   a. Electrons b. Holes
   c. None of the above d. Both

2. Which of the following atoms may be used as P-type impurity?
   a. Arsenic b. Boron
   c. Phosphorous d. Antimony

3. Voltage division rule is applicable to
   a. Series circuit b. Parallel circuit
   c. Both d. None of the above

4. The mathematical expression of Ohm's Law is
   a. I=VR b. R=VR
   c. V=I/R d. V=IR

5. When 12 V is applied across a 6 Ω resistor, the current is
   a. 2 A b. 3 A
   c. 4 A d. 6 A

6. The SI unit of resistivity is
   a. Ohm b. Ohm per metre
   c. Ohm-centimetre d. Ohm-metre

7. When reverse-bias is applied to a junction diode, it
   a. Raises the potential barrier b. Lowers the potential barrier
   c. Both d. None of the above

8. A half wave rectifier converts
   a. AC into DC b. DC into AC
   c. Both d. None of the above

9. The main component used in a half wave rectifier is
   a. Transistor b. Capacitor
   c. Diode d. All of these

10. A transistor has how many terminals?
    a. Two
    b. four
    c. One
    d. Three

11. The materials which can't conduct current are called
    a. Semiconductor
    b. Conductor
    c. Insulator
    d. Resistor

12. In conductor the forbidden energy gap is
    a. Large
    b. Small
    c. Overlapping each other
    d. None of the above

13. At low temperature, intrinsic semiconductor behaves like
    a. Conductor
    b. Insulator
    c. Semiconductor
    d. None of the above

14. To obtain a P-type semiconductor, the impurity added to a pure semiconductor is
    a. Pentavalent
    b. Trivalent
    c. Tetravalent
    d. None of the above

15. A transistor has
    a. One PN-junction
    b. Two PN-junction
    c. Three PN-junction
    d. Four PN-junction

-- --- --

Descriptive

Time : 1 hrs. 40 min. **Marks : 35**

[Answer question no.1 & any three (3) from the rest]

1. Differentiate between conductor, semiconductor and insulator with the help of energy band diagram. 5

2. a. Define semiconductor. Discuss the various types of semiconductor. 7+3=10
   b. State the electrical properties of semiconductor.

3. a. What is Ohm's Law? Write the factors affecting resistance. 6+4=10

   b. Calculate the resistivity of a material with a resistance of 3Ω and a cross-sectional area and length of 25 cm^2 and 10 cm, respectively.

4. a. What is a PN-junction Diode? Explain with the help of diagram the working principle of PN-junction diode. 7+3=10
   b. Write the differences between Donor impurities and Acceptor impurities.

5. a. Calculate the magnitude of current in each branch of a circuit consisting of two resistance 20 Ω and 30 Ω connected in parallel combination. Input voltage is given as 60 V. 6+4=10
   b. If two resistors of values 10 Ω and 40 Ω are connected in series across a voltage source of 200 V, then find the voltages across each resistor with the help of voltage division rule.

6. **Write short notes on the followings:** 5+5=10
   a. Half wave rectifier
   b. Transistor.

= = *** = =