MAHARAJA MANINDRA CHANDRA COLLEGE

B.Sc. PART-II PHYSICS (GEN.) PRACTICAL EXAMINATION, 2021

PAPER: III-B

FULL MARKS: 50

ANSWER ANY FIVE: (5X10=50)

1. Draw the circuit diagrams to verify AND and OR logic gate truth tables using diodes and NAND gates. Write the corresponding truth tables of AND, OR and NOT gates.   (2+2+2+2+2)

2. What are the advantages of a bridge rectifier over a full wave rectifier? Draw the circuit diagram of a bridge rectifier with filter. Write down the expression for percentage of regulation in load regulation for bridge rectifier.   (2+5+3)

3. Draw the circuit diagram of I-V characteristics of Zener diode in reverse biased condition. Draw a schematic diagram of reverse characteristic curve for Zener diode and indicate the knee voltage. What is the main use of Zener diode? What is the function of series resistance in the circuit of a reverse biased Zener Diode? What is the difference between Zener breakdown and avalanche breakdown?
                                                                  (2+2+2+2+2)

4. Define focal length of a lens. How many focal lengths are there? Why do you require an auxiliary convex lens to find the focal length of a concave lens? Write down the working formula needed to determine the focal length of a concave lens by auxiliary lens method.   (3+1+3+3)

5. Define Young's modulus of a metallic beam. Write the formula to draw the load-depression graph in the Young's modulus experiment and explain every term used in the expression. How does the Young's modulus of the material of a metallic beam change if its length is doubled?   (3+3+2+2)

6. What do you understand by specific rotation of an optically active sugar solution? Write the formula for calculating the specific rotation of an active substance in a reference liquid and mention all the variables used. Briefly explain the procedure to determine the concentration of a sugar solution using a polarimeter.   (2+2+6)