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**MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY**

**B.Tech. [SEM I (ITCA only)]**

**ASSIGNMENT SHEET-1**

***(Session: 2021-22)***

**INTRODUCTION TO ELECTRONICS ENGINEERING  
(BEC-105)**

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| **Unit:1** | **Topic: Semiconductor, Diodes** |
| **Date of Distribution: 14/02/2022**  **Date of Submission: After Minor Test** | **Name of Faculty: Dr. Shagun Pal** |

Q1 Explain the behavior of unbiased p-n junction.

Q2 What is depletion layer and junction potential in an unbiased p-n junction?

Q3 Explain the behavior of forward biased diode. Draw and explain the forward characteristics of a diode.

Q4 Explain the behavior of reversed biased diode. Draw and explain the reverse characteristics of a diode.

Q5 What is reverse breakdown? Explain the two breakdown mechanisms in a diode.

Q6 Write the diode equation and explain the significance of various terms.

Q7 Explain the V-I characteristics of diode. Explain the effect of temperature on a p-n junction. Define forward static and dynamic resistance of a diode.

Q8 The current of germanium diode is 100 μA at a voltage of -1V, at room temperature. Determine the magnitude of current for the voltage of ± 0.2 V at room temperature.

Q9 A silicon diode has a reverse saturation current of 60nA. Calculate the voltage at which 1% of the rated current will flow through the diode at room temperature if diode is rated for 1A.

Q10 For a silicon diode with reverse saturation current of 0.1 μA, calculate the dynamic forward and reverse resistance at a voltage of 0.62 and -0.62 V respectively , applied across the diode at room temperature of 26oC.

Q11 Write in detail about the two types of capacitances associated with a diode. State its practical significances.

Q12 What is rectifier? What are the important characteristics of a rectifier circuit? Explain why diode can be used as a rectifier?

Q13 Draw the circuit diagram of Half wave, Full wave and Bridge rectifier and explain its operation with proper expressions.

Q14 Define ripple factor and rectifier efficiency. What is the requirement of a rectifier in terms of ripple factor? How it is achieved?

Q15. Derive the expressions for the following parameters of the half wave rectifier circuits:

a. Average d.c. current (IDC)

b. Average d.c. voltage (EDC)

c. R.M.S. value of current (IRMS)

d. D.C. Power output (PDC)

e. Ripple facto(η) and ripple efficiency (γ)

References:

*1. Robert L. Boylestand / Louis Nashelsky “Electronic Devices and Circuit Theory”, Latest Edition, Pearson Education.*

*2. H S Kalsi, “Electronic Instrumentation”, Latest Edition, TMH Publication.*

*3. George Kennedy, “Electronic Communication Systems”, Latest Edition, TMH.*

*4. David A. Bell, “Electronic Devices and Circuits”, Latest Edition, Oxford University Press.*

*5. Jacob Millman, C.C. Halkias, Staya brataJit, “Electronic Devices and Circuits”, Latest Edition, TMH.*