

S.D. COLLEGE OF ENGINEERING & TECHNOLOGY
MUZAFFARNAGAR
Deptt. Of Electronics & Communication Engg.

Sem: 4th

Subject : Analog Circuits

Subject Code: KEC 402

Assignment 1

- Q.1 Explain crystal structure. Do a neat classification of various types of semiconductors and explain the following-
1. SC
 2. BCC
 3. FCC
- Q.2 Discuss Phonon Spectra and optical and thermal properties of Semiconductor.
- Q.3 What do you understand by PN junction Breakdown?
- Q.4 Discuss Static Characteristics of BJT.
- Q.5 Explain different terminal function of PN Junction Diode.

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Assignment 2

- Q.1 Do a neat comparison between BJT and MOSFET. How amplification is achieved through BJT?
- Q.2 Discuss Heterojunction Bipolar Transistor.
- Q.3 Explain the construction and working of depletion type and Enhancement type MOSFET.
- Q.4 Enumerate the special features of MESFET. Explain its working and discuss difference in its characteristics from the MOSFET.
- Q.5 Discuss MODFET's. Compare MESFET And MODFETs.

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Assignment 3

- Q.1 What is meant by IMPATT? Explain with neat and clean diagram the BRITT DIODE.
- Q.2 Explain the working of Tunnel diode. And also explain the backward diode.
- Q.3 Draw and explain the working principle of TRAPATT diode. Calculate the avalanche zone velocity for a TRAPATT diode having $N_a = 10^{15}/\text{cm}^3$ and current density $J = 8\text{ k Amp}/\text{cm}^2$.
- Q.4 Derive an expression for power output and efficiency of a MSM BARITT diode
- Q.5 Discuss static and dynamic characteristic of IMPATT diode.

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Assignment 4

Q.1 Do a neat comparison between BJT and MOSFET. How amplification is achieved through BJT?

Q.2 Compare CB,CE and CC configuration of a transistor. Also prove that

$$I_C = \beta I_B + (1 + \beta) I_{CO}$$

Q.3 Explain the construction and working of depletion type and Enhancement type MOSFET.

Q.4 What do you understand by MISFET? Explain.

Q.5 Enumerate the special features of MESFET. Explain its working and discuss difference in its characteristics from the MOSFET.

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Assignment 5

Q.1 What do you understand by photo detector? Describe the following photo detectors on the basis of basic construction, symbol and working,

1. LDR
2. Solar Cell

Q.2 Define light emitting materials. What determines the emission of color of LED? Do a comparison between LED vs. Photo diode.

Q.3 What is tunneling phenomenon? Explain the V-I characteristic of Tunnel diode.

Q.4 Explain the IMPATT diode at following points-

- (a) Construction
- (b) Principle of operation
- (c) Application

Q.5 Explain the operation and V-I characteristic of the following in brief,

- (i) SCR
- (ii) DIAC
- (iii) TRIAC
- (iv) IGBT