

7. (a) Differentiate between sputtering and evaporation process in detail. 8
- (b) Explain the working principle of a Solar Cell. Mention its applications. 7

Roll No.

Total Pages : 04

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B.Tech. (EL) (Sixth Semester)
Electronics Devices (ELOE-101)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) Why Transistor is called Current Controlled Device ? 1.5
- (b) What is early effect ? How does it modify the V-I characteristics of a BJT ? 1.5
- (c) Explain when a FET acts as a voltage variable resistor. 1.5
- (d) Explain the parameters α , β , γ in transistor. Give the relation between them. 1.5
- (e) Define reverse leakage current in C. E configuration. 1.5

- (f) What are the various methods used for transistor biasing ? Which one is popular ? 1.5
- (g) Will a transistor result if two diodes are connected back to back ? 1.5
- (h) What do you understand about the collector reverse saturation current ? 1.5
- (i) What is meant by gate source threshold voltage of a FET ? 1.5
- (j) What are the applications of Photodiode ? 1.5

Part B

2. (a) Discuss about the effects of temperature on PN junction diode's Forward and Reverse characteristics. 8
- (b) If the base current in a transistor is $20\mu\text{A}$ when the emitter current is 6.4 mA , what are the values of α and β ? Also calculate the collector current. 7
3. (a) Sketch the static characteristics of a common collector transistor and bring out the essential features of input and output characteristics. 8

- (b) What is Fermi level ? Prove that the Fermi level lies exactly in between conduction band and valance band of intrinsic semiconductor. 7

4. (a) Define 'load-line' and give its significance. Compare a.c. load line and d.c. load line. 8
- (b) Illustrate the applications of LEDs and Solar Cell toward society in terms of medical, research and development and information technology ? 7
5. (a) Discuss in detail the fabrication steps of a nMOS transistor. 8
- (b) Compare Zener Breakdown and Avalanche Breakdown in detail. 7
6. (a) Describe the Si oxidation techniques. What are the uses of SiO_2 in VLSI circuits ? Classify the SiO_2 layer formation techniques and discuss them in detail. 8
- (b) Draw the hybrid- π model and obtain the expression for the diffusion capacitance. 7