

Hall Ticket No:

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Question Paper Code :

**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)**

B. Tech I Semester Regular Examinations November - 2015

(Regulations: R15)

Basic Electronics Engineering

Date:

Time: 3 hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

1. a. Distinguish drift current and diffusion current. (4M)
b. Derive the expression for Hall Voltage and state its applications. (8M)

(or)

2. a. Derive the following
i. Tolerance ii. Resistivity iii. Permittivity iv. Permeability (4M)
b. Describe the following with the help of relevant diagrams
i. Self inductance & Mutual inductance ii. Mass Action Law (8M)

UNIT-II

3. a. Distinguish among different types of electrical connectors. (4M)
b. Draw a neat diagram of CRT and explain its operation. (8M)

(or)

4. a. What is the basic principle of operation of battery, explain. (4M)
b. Relate and distinguish the operation of SPDT and DPDT switches. (8M)

UNIT-III

5. a. For the zener voltage regulator .Determine the range of R_L and I_L that gives the stabilizer voltage 10V. (given $V_i=40V, R_s=1K\Omega, V_Z=10V, I_{Zmax}=24mA, I_{Zmin}=5mA$) (4M)
b. Derive the equation for ripple factor of half wave rectifier with capacitor filter. (8M)

(or)

6. a. Derive the efficiency of a full wave rectifier and explain the operation of a Center tapped rectifier with waveforms. (4M)
b. Draw the V-I characteristics of PN diode and explain about its operation in open circuit, Forward bias and Reverse bias conditions. (8M)

UNIT-IV

7. a. Draw the i/p and o/p characteristics of CE configuration and explain. (4M)
b. Draw the V-I Characteristics of N-Channel JFET and explain the working of a JFET. (3M)
c. The following information is included in the data sheet for an N-channel JFET $I_{DSS}=20\text{mA}$, $V_P=-8\text{V}$ and $g_{m0}=5000\mu\text{S}$. Determine the values of drain current and Trans conductance at $V_{GS}=-4\text{V}$ (5M)

(or)

8. a. i. Derive the relationship between α and β of a transistor. (2M)
ii. If the emitter current $I_E=1.2\text{mA}$ and $\beta=60$ find α, I_B, I_C . (2M)
b. Distinguish between the construction and working principle of a MOSFET in enhancement and depletion mode with neat diagrams. (8M)

UNIT-V

9. a. Draw and explain the block diagram of an operation amplifier. (4M)
b. Draw the required circuit and explain the operation of a 555 Timer in Monostable mode. (8M)

(or)

10. a. i. What are the advantages of ICs over discrete components? (2M)
ii. List the ideal characteristics of op-amp. (3M)
b. List the types of IC voltage regulators and explain the IC 78XX voltage regulator with internal diagram. (7M)

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UNIT-1

1. a. With the help of examples, explain about the Open circuit and Short circuit troubles. (4M)
- b. Describe the following with the help of relevant diagrams.
 - i. Linear characteristics between V and I
 - ii. Mass Action Law. (8M)

(or)

2. a. Justify the Capacitor as an energy storage device. (4M)
- b. State the applications of Hall Effect and derive the equation for Hall Voltage with neat diagram. (8M)

UNIT-2

3. a. What are the required tools for soldering and describe the process of soldering. (4M)
- b. List out the wire conductors and their applications. (4M)
- c. What are the applications of CRO. (4M)

(or)

4. a. Distinguish between different types of switches. (4M)
- b. List the applications of different types of fuses and explain their importance. (4M)
- c. Describe the basic principle of operation of battery. (4M)

UNIT-3

5. a. Draw the circuit diagram of a bridge rectifier and explain its working. (4M)
- b. List out some special diodes and their corresponding applications. (4M)
- c. What are the applications of PN diode in forward and reverse bias? (4M)

(or)

6. a. Draw the reverse bias characteristics of PN diode and explain reverse saturation current. (4M)
- b. Explain the following terms:
 - i. Cut-in voltage
 - ii. Breakdown voltage
 - iii. Dynamic resistance
 - iv. Majority and Minority charges (8M)

UNIT-4

7. a. Draw the required characteristics to explain the different regions of operation of a BJT. (4M)
b. What is the need of proper biasing to a BJT and explain different biasing techniques. (8M)

(or)

8. a. Distinguish between a BJT and a FET (4M)
b. Explain different biasing techniques to a FET, with required diagrams. (8M)

UNIT-5

9. a. Draw the op-amp voltage regulator circuit and explain its working as a regulator with the help of its characteristics. (4M)
b. Draw the block diagram and explain the modes of operation of IC555. (8M)

(or)

10. a. What are different applications of inverting and non inverting mode op-amp circuits (4M)
b. Draw the circuit of a differential circuit and explain its working as a comparator. (8M)