

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Electrical Engineering

Semester: 3

Subject Code

Subject Name BASIC ELECTRONICS

Sr. No.	Course content
1.	History of electronics : 1.1 First generation-H.V tubes/gas tubes -Electron emission -Brief introduction of H.V. Diode, Triode, Tetrode, Pentode, Beam power Tube, VR tube, Photo tube (Symbol, constructional diagram only, label electrodes.) -Cathode ray tube (CRT) -construction -components -working -Applications. 1.2 Second generation - simple introduction in brief about semiconductor devices 1.3 Third generation - simple introduction in brief about small scale integrated circuit 1.4 Fourth generation- simple introduction in brief LSI 1.5 Fifth generation - simple introduction in brief VLSI
2.	Semiconductor diode : 2.1 P type, N type semi conductor with energy level diagram Formation of P-N junction 2.2 Type of P-N junction -grown junction - alloy junction -diffused junction -epitaxial junction 2.3 P-N junction diode -conduction in P-N junction diode, symbol -Forward bias & reverse bias characteristics -applications 2.4 Symbol, construction, characteristic & applications of- Zener diode, tunnel diode, varactor diode, photo diode

3.	<p>Transistor :</p> <p>3.1 Formation of a transistor</p> <ul style="list-style-type: none"> -P-N-P & N-P-N transistor with symbol -Conduction thro' transistor (treatment of N-P-N transistor only) -Leakage current in a transistor -Relationship between α & β <p>3.2 Transistor configuration</p> <ul style="list-style-type: none"> - Common Base(C-B) configuration - Common Emitter(C-E) configuration - Common Collector(C-C) configuration <p>3.3 Transistor characteristics</p> <ul style="list-style-type: none"> - C.B – brief explanation - C.E – circuit diagram, characteristics <p>3.4 Load line</p> <ul style="list-style-type: none"> - d.c load line -a.c load line <p>3.5 Transistor as an amplifier (C-E configuration only)</p> <p>3.6 H-parameters</p> <ul style="list-style-type: none"> -equations -definition
4.	<p>Semiconductor Devices :</p> <p>4.1 Construction, characteristics & applications (with circuit diagram) of</p> <ul style="list-style-type: none"> - FET & MOSFET - DIAC -IGBT (introduction only) - UJT - TRIAC - SCR - PUT
5.	<p>Optoelectronic devices :</p> <p>5.1 Construction, characteristic, & applications (with circuit diagram) of</p> <ul style="list-style-type: none"> - Photo Diode - Photo transistor - LDR, LED, LCD - Opto coupler - LASER <p>5.2 Introduction to fiber optics</p>
6.	<p>Specification, coding & testing of electronics components :</p> <p>6.1 colour coding of resistor, capacitors</p> <p>6.2 color coding for small transformer</p> <p>6.3 Specification & testing of (use data book)</p>

	-semi diode, LED -BJT -SCR -UJT -single phase bridge rectifier module 6.4 Use of data book & data manual to identify the component & its specifications of transistor, power transistor, FET, UJT, semiconductor Diode, SCR etc.
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LABORATORY EXPERIMENTS :

1. Characteristics of p-n junction diode
2. Characteristics of Zener diode
3. Testing of semiconductor diode (1N4001 TO 1N4007, BY125, OA79, DR32 etc.
4. C-E transistor amplifiers
5. Characteristics Of transistor C-E configuration
6. Testing of transistor with multimeter
7. Characteristics of FET
8. Characteristics of UJT
9. UJT as a relaxation oscillator
10. Characteristics of SCR
11. Characteristics Of TRIAC (1st & 3rd quadrant)
12. Application of Diac & Triac (Fan regulator, Light dimmer etc.)
13. Characteristics of LDR
14. Testing of single phase bridge rectifier module
15. Testing of SCR
16. Color coding of resistor-give problems, use multimeter
17. Write specifications of- Junction diode, Transistor (AC125, AC126, 2N3055, SL100, SK100, and BC147 etc.), UJT-2N2646, 2N2647, FET- BFW10 using data manual

DEMONSTRATIONS :

- 1 CRT with base diagram
- 2 Demo. Of LED,LCD
- 3 Demo. Of Opto coupler
- 4 Demo. Of fiber optics
- 5 Capacitor color coding

Reference Books:

1. Electronic Devices and circuits an introduction By Allen Mottershed publication prentice Hall
2. Electronics Principles Malvino - TMH.
3. Basic Electronics and linear circuits N.N. Bhargav, D.C. Kulshreshtha, S.C.Gupta, TTTL, Chandighad
4. Principle of Electronics V.K. Mehta, S.Chand & W