**D1 1**

 

**JSPM’s**

**Jayawantrao Sawant Polytechnic, Hadapsar, Pune**

**Department of Electronics and Telecommunication**

**nn**

**Institute code:** 0788 **Subject Code:** 22216

**Course and Code:**  EJ2I **Class:** FY EJ

**Semester:** Second  **Name of Faculty:** Ms.A.D.Kulkarni

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| **Chap.No. (Total**  **Hrs.)** | **CO** | **UO** | **Title/Details Allocated** | **Hrs. in**  **Curriculum** | **Planned Date** | **Completion**  **Date** | **Teaching**  **Method/**  **Media** | **Remarks** |
| **1**  **(12 Hours)** | **a** | **1a** | **Semiconductor Diode:**  Different types of Materials: Insulator, Conductor & Semiconductor- energy band theory and Effect of Temperature | **1 HOUR** |  |  |  |  |
| 1b | Differentiate between Conductor, Semiconductor, Insulator | **1HOUR** |  |  |  |  |
| 1b | Intrinsic and Extrinsic Material, Doping and P-type and N-type, Trivalent and Pentavalent Impurities. | **1HOUR** |  |  |  |  |
| 1c | Construction, Symbol of PN junction Diode | **1HOUR** |  |  |  |  |
| 1c | Working of PN junction Diode – Forward Biasing & Reverse Biasing | **1HOUR** |  |  |  |  |
| 1c | V-I Characteristics of PN Junction Diode, Applications | **1HOUR** |  |  |  |  |
| 1c | Construction, Working and V-I characteristics of Zener Diode | **1HOUR** |  |  |  |  |
| 1c | Construction, Working and V-I characteristics of LED | **1HOUR** |  |  |  |  |
| 1c | Construction, Working and V-I characteristics of Photo Diode | **1HOUR** |  |  |  |  |
| 1c | Applications of different types of Diodes | **1HOUR** |  |  |  |  |
| 1c | Comparison of PN and Zener Diode | **1HOUR** |  |  |  |  |
| 1d | Effect of Temperature on different types of Diodes | **1HOUR** |  |  |  |  |
| **2**  **(14 Hours)** | **b** | **2a** | **Application of Diodes:** Rectifiers- Need of rectifiers, Types of rectifiers – HWR, FWR, Bridge Rectifier | **1HOUR** |  |  |  |  |
| 2a | HWR circuit operation, I/O waveforms for voltage & current | **1HOUR** |  |  |  |  |
| 2a | FWR centre tap- circuit operation, I/O waveforms for voltage & current | **1HOUR** |  |  |  |  |
| 2a | FWR bridge - circuit operation, I/O waveforms for voltage & current | **1HOUR** |  |  |  |  |
| 2b | Comparison of three types of rectifiers  **Filters -** Need of filters | **1HOUR** |  |  |  |  |
| 2b | Circuit diagrams, operation and input-output waveforms of Shunt capacitor filters | **1HOUR** |  |  |  |  |
| 2b | Circuit diagrams, operation and input-output waveforms of Series inductor filters | **1HOUR** |  |  |  |  |
| 2b | Circuit diagrams, operation and input-output waveforms of LC filters | **1HOUR** |  |  |  |  |
| 2b | Circuit diagrams, operation and input-output waveforms of π filters | **1HOUR** |  |  |  |  |
| 2b | Circuit diagram, operation, waveforms of series (biased and unbiased) clippers using diodes | **1HOUR** |  |  |  |  |
| 2b | Circuit diagram, operation, waveforms of shunt (biased and unbiased) clippers using diodes | **1HOUR** |  |  |  |  |
| 2c | Circuit diagram, operation, waveforms of positive clampers | **1HOUR** |  |  |  |  |
| 2c | Circuit diagram, operation, waveforms of negative clampers | **1HOUR** |  |  |  |  |
| 2d | Numerical for calculating PIV, ripple factor, efficiency. | **1HOUR** |  |  |  |  |
| **3**  **(16 Hours)** |  | **3a** | **Bipolar Junction Transistors**  Introduction- Basic concept,  types of transistors | **1HOUR** |  |  |  |  |
| 3a | Construction of NPN transistor | **1HOUR** |  |  |  |  |
| 3a | Construction of PNP transistor | **1HOUR** |  |  |  |  |
| 3a | Working principle of NPN and PNP transistor | **1HOUR** |  |  |  |  |
| 3b | CB configuration and its input and output characteristics | **1HOUR** |  |  |  |  |
| 3b | CE configuration and its input and output characteristics | **1HOUR** |  |  |  |  |
| 3b | CC configuration and its input and output characteristics | **1HOUR** |  |  |  |  |
| 3b | Comparison between CB, CC & CE, Transistor switch | **1HOUR** |  |  |  |  |
| 3c | Need for biasing, Concept of DC load line | **1HOUR** |  |  |  |  |
| 3c | operating point (Q), Reasons for instability | **1HOUR** |  |  |  |  |
| 3c | Stabilization techniques | **1HOUR** |  |  |  |  |
| 3d | Thermal runaway  Types of biasing | **1HOUR** |  |  |  |  |
| 3d | Fixed biasing circuits biasing | **1HOUR** |  |  |  |  |
| 3d | Base biased with emitter feedback biasing | **1HOUR** |  |  |  |  |
| 3d | Voltage divider biasing | **1HOUR** |  |  |  |  |
| 3d | Comparison of different biasing methods | **1HOUR** |  |  |  |  |
| **4**  **(12 hours)** |  | **4a** | **Field Effect Transistors (FET)**  FET: Construction of JFET n-channel | **1HOUR** |  |  |  |  |
| 4a | FET: Construction of JFET p-channel | **1HOUR** |  |  |  |  |
| 4b | Working principle of n-channel and p-channel JFET, Characteristics (Drain characteristics & Transfer characteristics) | **1HOUR** |  |  |  |  |
| 4b | FET biasing  Source self biasing | **1HOUR** |  |  |  |  |
| 4b | Drain to source biasing, Applications of JFET | **1HOUR** |  |  |  |  |
| 4c | MOSFET : Introduction, types, Construction of D-MOSFET | **1HOUR** |  |  |  |  |
| 4c | Working principles & Applications of D-MOSFET | **1HOUR** |  |  |  |  |
| 4d | Construction of E-MOSFET, Working principles & Applications of E-MOSFET | **1HOUR** |  |  |  |  |
| **5**  **(10HOurs)** |  | **5a** | **Regulators & Power supply**  Regulators:  Need of regulators | **1HOUR** |  |  |  |  |
| 5b | Concept of load regulations | **1HOUR** |  |  |  |  |
| 5b | Concept of line regulations | **1HOUR** |  |  |  |  |
| 5c | Zener diode as voltage regulator | **1HOUR** |  |  |  |  |
| 5c | Output Voltage of Zener regulator | **1HOUR** |  |  |  |  |
| 5c | Transistorized regulators: series voltage regulator | **1HOUR** |  |  |  |  |
| 5c | Shunt voltage regulators | **1HOUR** |  |  |  |  |
| 5d | Linear Regulators: | **1HOUR** |  |  |  |  |
| 5d | Block diagram of DC Regulated power supply and functions of each Block | **1HOUR** |  |  |  |  |
| 5d | Load Line Regulation calculations of the transistorized regulators | **1HOUR** |  |  |  |  |

**Subject Teacher HOD**