BASIC ELECTRONICS ENGINEERING

Course Code - Category: CSE 113 - ES **Credits:3**

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3	0	0	1	3

End Exam: 3 Hours

Sessional Marks:40

End Exam Marks:60

Prerequisites: Nil

Course Outcomes:

After completion of the course the student will be able to	
CO1	nderstand the behavior of PN diode under different biasing conditions.
CO2	Calculate the efficiency and ripple factor of half wave, Full wave center tapped and Bridge rectifiers with and without filters
CO3	Obtain input and output characteristics of BJT in different configurations and identify the region of operation of transistor
CO4	Design the transistor biasing and compensation circuits for better stability
CO5	Device the characteristics of FET/MOSFET in different modes

SYLLABUS

Unit-I: Semiconductor diodes **9 periods**

Intrinsic Semiconductors, Fermi energy level, Mass action law, Extrinsic semiconductors, Conductivity of semiconductor materials, Diffusion current, Drift current, Mean life time and diffusion length of charge carriers, Hall effect, Unbiased PN Junction, Energy levels of PN Junction diode, PN Junction diode Forward and reverse biases, Diode current equation, Junction capacitances, Avalanche and Zener Break down, Varactor diode and Photo diode.

Unit-II: Rectifiers and Filters **9 periods**

Half wave rectifier, Full wave center tapped and Bridge rectifiers, Rectifier- DC components, AC Components, Ripple factor, Transformer Utilization factor, Efficiency, PIV, and Regulation
Filters: Inductor, Capacitor, LC, CLC filters, Ripple factor

Unit-III: Transistor Characteristics **9 periods**

Common Base, Common Emitter, Common Collector Configurations, Transistor current components, Input and Output Characteristics, Punch through effect, Active region, Saturation region, Cutoff region, Transistor as switch.

Unit-IV: Transistor biasing and Stabilization **9 periods**

Biasing of transistor, DC load line, Operating point, fixed bias, Collector –Base bias, Self bias or Voltage divider bias, Diode Compensation, Thermistor compensation, Sensistor Compensation, Small signal CE amplifier.

Unit-V: FET/MOSFET Characteristics **9 periods**

Classification of FET, Construction of n-JFET and p-JFET, Transfer and Drain characteristics, Construction of MOSFET, Characteristics of enhancement and depletion mode MOSFETs, Common source FET amplifier.

Text Books:

1. **R.L.Boylestad**, "*Electronic Devices and Circuit theory*", Pearson Education India, 2015.
2. **Jacob Millman, Christos halkias, Chetan D Prakash** " *Millman's Integrated Electronics*"- Tata McGraw-Hill, 2012

Reference Books:

1. **David A Bell** "*Electronic Devices and Circuits*" -; Oxford
2. **K Venkata Rao, K Rama** "*Sudha Electronic Devices and Circuits*" –; McGraw Hill Education – 2015
3. **Jacob Millman, Arvin Grabel** "*Micro Electronics"* –; Tata McGraw-Hill