

**SARDAR PATEL UNIVERSITY**  
**Programme: B.Sc (Physics)**  
**Semester: III**  
**Syllabus with effect from: June-2012**

<b>Paper Code: US03CPHY02</b>	<b>Total Credit: 3</b>
<b>Title Of Paper: Basic Solid State Electronics</b>	

Unit	Description in detail	Weighting (%)
I	<b>Transistor Biasing Circuits</b> Introduction, Need to bias a transistor, Selection of operating point, Need for bias stabilization, Requirement of a biasing circuits, Different biasing circuits, Fixed-bias circuit, Collector to base bias circuit, Voltage divider biasing circuit, Approximate analysis, Accurate analysis, Emitter- bias circuit, PNP transistor biasing circuit, Related numericals	
II	<b>Small Signal Amplifiers and h-parameters</b> Introduction, Single stage transistor amplifier, Amplifier performance analysis methods, Graphical method, AC and DC load lines, Calculation of gain, Input and output phase relationship, Equivalent circuit method, Development of transistor AC equivalent circuit, h- parameter equivalent circuit, Amplifier analysis, Need of multistage amplifier, Gain of multistage amplifier, Related numericals	
III	<b>Feedback in Amplifiers</b> Concepts of feedback in amplifiers, Types of feedback, Voltage gain of feedback amplifier, Advantages of negative feedback, Stabilization of gain, Reduction in distortion and noise, Increase in input impedance, Decrease in output impedance, Increase in bandwidth, Amplifier circuit with negative feedback, RC coupled amplifier without bypass capacitor, Emitter follower, Related Numericals	
IV	<b>Oscillators</b> Need of an oscillator, Classification of oscillators, Tuned circuit for generation of sine waves, Frequency of oscillation in LC circuit, Sustained oscillations, Positive feedback amplifier as an oscillator, The starting voltage, Hartley oscillator, Colpitts oscillator, Basic principles of RC oscillator, Phase shift oscillator, Wien bridge oscillator, Crystal oscillators, Crystal oscillator circuit, Related Numericals	

**Basic Text & Reference Books:-**

- Electronic Principles  
A P Malvino  
Tata McGraw Hill Publishing Co. Ltd., New Delhi
- Basic Electronics (Solid State)  
B L Theraja  
S Chand, New Delhi
- Basic Electronics and Linear Circuits  
N N Bhargava, D C Kulshreshtha and S C Gupta  
Tata McGraw Hill Publishing Co. Ltd., New Delhi

