3002 - ELEMENTS OF ELECTRONICS

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
					Theory		Practical Ex.	Total
Lectures	Practical	Credits						
3	1	4	25	25	3Hrs.	100	-	150

Pre-requisite	Source
Nil	EXN

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	25	–	125

RATIONALE:

1. BASIC SEMI-CONDUCTOR THEORY Structure of an atom, properties, charge of an electron, behaviour of electrons in an electric, magnetic field. Electronic emissions, work functions, electron volt, different types of electron emissions. Intrinsic and extrinsic semi-conductors, energy-level diagram, P-type and N-type semi-conductors, PN junction diode, V I characteristics, Rectification actions using PN junction diode, half wave and full wave rectifications, bridge rectifier, important performance parameters of rectifiers, their definition and expressions. Zener diode, voltage regulator.	12	25
2. TRANSISTORS Construction, working action of PNP and NPN transistors, biasing methods. Transistor connections in different configurations, characteristics. Basic common emitter amplifier circuit. Different methods of cascading amplifiers like DC, RC, transformer coupling. Power amplifier, push-pull amplifier.	8	15
3. FEEDBACK IN AMPLIFIER Positive and negative feedback. Voltage-series feedback. Barkhansen criterion for oscillators, tuned, Colpitts and Hartley oscillators, transistorised astable multivibrator.	6	15
4. OPERATIONAL AMPLIFIERS Differential amplifiers, CMRR, op amp characteristics, important parameters, op amp as inverting, non-inverting amplifier, adder, sub-tractor.	5	10
5. LOGIC CIRCUITS Binary number system, truth tables of logic-gates, RS. Flip-flop, Binary Counter.	5	10
6. DEVICES BJT, FET, UJT, SCR, Triac, Diac their construction and characteristics. Basic application circuits involving the above devices like amplifier, timer, rectifier, etc.	8	15
7. TEST AND MEASURING INSTRUMENTS Study of CRO, signal generator, power supply, multi-meter at the block diagram level.	4	10
Total	48	100

PRACTICALS

Demonstrations of the following experiments (Any 6)

1. Study of test and measuring instruments.
2. Test and study of active and passive components
3. Study of diode characteristics.
4. Study of diode as rectifier.
5. Study the working of Zener regulator.
6. Study of logic gates
7. Study of RS flip-flop.
8. Study of opamp applications
9. Study of timer.
10. Study of transistor characteristics.
11. Study of transistor as an amplifier (Single stage).
12. Study of transistor amplifier (Cascaded).

REFERENCE BOOKS

1. Elements of Electronics - M. K. Bagate, S. P. Singh & Karmal Singh
2. Electronic Principles - Malvino
3. Basic Electronics - Bhargava & others.
4. Electronic Devices & circuits - G. K. Mithal.