

Rajasthan ILD Skills University

B.VOC in Electrical Appliances Services and Maintenance

Year- Second Year

Semester-IV

Syllabus: Electrical Appliances Services and Maintenance

STRUCTURE TABLE

S.N.	Paper Title	Paper Category	Credits			Total Credits	EOSE Duration (Hrs.)		
			Theory	Practical	Self/Project/Industry		T	P	S
1	Electronics Devices	Skill	3	3	-	6			
2	Analog Electronics	Skill	3	3	-	6			
3	Electrical Ac Machines –II	Skill	3	3	-	6			
		TOTAL	9	9		18			

1. ELECTRONIC DEVICES

- **Transistors:** Characteristics, Current Components, Current Gains, alpha and beta. Variation of transistor parameter with temperature and current level, Operating point, Hybrid model, DC model of transistor, h-parameter equivalent circuits. CE, CB and CC configuration DC and AC analysis of single stage CE, CC (Emitter follower) and CB amplifiers AC & DC load line,
- **JFET & MOSFET:** Construction and operation of JFET & MOSFET, noise performances of FET, parasitic of MOSFET, small signal models of JFET & MOSFET Biasing of JFET's & MOSFET's. Low frequency single stage CS and CD (source follower) JFET amplifiers FET as voltage variable resistor and active load.
- **Small Signal Amplifiers at Low Frequency:** Analysis of BJT and FET multistage amplifier, DC and RC coupled amplifiers. Frequency response of single and multistage amplifier, mid-band gain, gains at low and high frequency. Analysis of DC and differential amplifiers, Miller's Theorem, use of Miller and bootstrap configuration. Cascade and cascade configuration of multistage amplifiers (CE-CE, CE-CB, CS-CS and CS-CD), Darlington pair.

2. ANALOG ELECTRONICS

- **Feedback Amplifiers:** Classification, Feedback concept, Feedback Topologies, Transfer gain with feedback, General characteristics of negative feedback amplifiers
- **Oscillators & Multivibrators:** Classification, Criterion for oscillation, Tuned collector, Hartley, Colpitts, RC Phase shift, Wien Bridge and crystal oscillators.
- **High Frequency Amplifiers:** Hybrid Pi model, conductance's and capacitances of hybrid Pi model, high frequency analysis of CE amplifier Gain bandwidth product, unity gain frequency f_T . Emitter follower at high frequencies.
- **Tuned Amplifier:** Band pass amplifier, Parallel resonant circuits, Band Width of Parallel resonant circuit. Analysis of Single Tuned Amplifier, Primary & Secondary Tuned Amplifier with BJT & FET
- **Power Amplifiers:** Classification, Power transistors & power MOSFET (DMOS, VMOS). Output power, power dissipation and efficiency analysis of Class A, class B, class AB, class C, class D and class

E amplifiers as output stages. 4 Pushpull amplifiers with and without transformers. Complementary symmetry & quasi complimentary symmetry amplifiers

3. ELECTRICAL AC MACHINES –II

- **Polyphase Induction Motor:** Introduction. Construction, cage and wound rotors, principal, starting and running torque, condition for maximum torque, equivalent circuits, no load and block rotor test. Torque-slip characteristics, losses and efficiency, , starting of cage and wound motors, speed control, cogging and crawling, double cage rotor, induction generator, application.
- **Single Phase Induction Motor:** Introduction, construction, principal, double revolving field theory, equivalent circuit, performance calculations, starting methods, and their types, torque slip characteristics of various types.
- **Special Machines:** Single phase synchronous motor, series motor, universal motor, Stepper motors variable reluctance, permanent magnet and hybrid stepper motors.
- **Synchronous Generators (Alternators):** Introduction, Construction, advantages of rotating field, types of rotors, emf equation, excitation systems, equivalent circuit and their phasor diagrams, voltage regulation, synchronous impedance method, mmf method. Zero power factor method, two reaction theory of salient pole rotor, phasor diagram, power developed and power angle characteristics of salient pole machine, determination of X_d and X_q , synchronization, synchronizing power and torque, parallel operation application.
- **Synchronous Motors:** Introduction, construction, principal of operation, starting of synchronous motor, equivalent circuit and phasor diagrams, power and torque, performance calculation, speed torque characteristics, power factor control-effect of change of excitation. 4 V curve and inverted V curve, synchronous condenser and reactors, synchronous