ELECTRICAL ENGINEERING SYLLABUS(BELOW DEGREE STANDARD)

1. **ELEMENTS OF ELECTRICAL ENGINEERING:-**
   Electric current and ohm's law - Resistance and temperature effects - Work ,power and energy – Electrostatics – Capacitors - Secondary cells and batteries - Electrical engineering materials.

2. **ELECTRICAL CIRCUITS:-**
   DC circuits - Magnetism and magnetic circuits - Electromagnetic induction - AC principles – Vector algebra - Single phase AC circuits - Polyphase AC circuits.

3. **ELECTRONICS – I :-**
   Semiconductors – Diodes – Transistors - Optoelectronic devices - IC fundamentals - Digital principles - Boolean algebra and logic gates - IC logic families.

4. **ELECTRONICS – II :-**
   Basic electronic circuits - Amplifiers and oscillators - Operational amplifiers and timers - Arithmetic circuits - Flip flop - Shift registers – Counters - Encoders, decoders, Multiplexer and demultiplexer - D/A and A/D converters - Semiconductor memories.

5. **ELECRICAL MACHINES – I :-**
   DC Generators:-
   Working principle of DC generator - Construction and types - Armature windings - Induced EMF - Armature reaction – Commutation – Characteristics - Efficiency and regulation.
   DC Motors:-
   Construction and working principle of DC motor - Types of DC motors - Torque in DC motors - Characteristics of DC motor - Speed control - Starting Devices.
   Special Motors:-
   construction and working principle ,applications of special motors
   Alternators:-
   Construction and working principle - Armature winding - EMF equation - Armature reaction - Vector Diagram - Voltage regulation - Excitation systems - Parallel operation- Hunting and cooling.

6. ELECRICAL MACHINES – II :-

Transformers:-

Working principle of transformer - EMF equation - Operation on no load and on load - Equivalent Circuit - Regulation and efficiency - Three phase transformers - Cooling of transformer - Welding transformer - Auto transformer - Parallel operation.

Induction Motors:-

Working principle - Types of induction motor and their constructional details - Torque slip curves - Equivalent circuit - Power output - Circle diagram - Starting of Induction motor - Types of starting - Soft starters - Different methods of speed control - Linear induction motor - Induction Generator.

Synchronous motors:-

Working principle - Operation on load – Characteristics – Hunting - Starting method - Applications - Permanent Magnet Synchronous motor.

Single Phase motors:- Split phase and capacitor motors

7. ELECRICAL AND ELECTRONICS MEASUREMENTS :-

Characteristics of instruments - Classification and essentials of measuring instruments - Ammeters and Voltmeters - Wattmeters - Energy meters - Galvanometers - Range extension of meters - Special meters - Measurement of resistance - Measurement of Inductance and Capacitances - Calibration of meters - Transducers - Telemetry.

8. COMMUNICATION AND COMPUTER NETWORKS :-

Communications:-

Communication basics - Fiber optic communications - Microwave techniques - Satellite communication .

Computer Networks:-

Networks - Transmission media - Network Architecture – Ethernet - Wireless LANs- Network internet work connectivity - WAN technologies - Basic Computer Skills.

9. ELECTRICAL POWER GENERATION :-

Hydroelectric power plant - Thermal power plant - Nuclear power plant - Diesel power Plant - Gas power plant - Solar power plant - Wind power plant - Tidal power plant - Biomass power plant - Fuel cells - Power plant operation - Economics of power generation - Power factor improvement.

10. POWER ELECTRONICS :-

Power semiconductor devices - SCR controlled circuits - Controlled rectifiers - Choppers - Inverters - Cycloconverters - Device Protection - Power supplies and stabilizers - Switch mode converters - Power electronic s application.

11. SWITCHGEAR AND PROTECTION :-

Introduction to switchgear - Symmetrical fault calculations - Circuit breakers - Fuses - Protective relays - Protection of Alternators and Transformers - Protection of Busbars and lines.

12. INDUSTRIAL DRIVES AND CONTROL :-

Industrial drives:-

Electric motor drives - Driven machine mechanism - Process flow diagram and process and selection of motors - Selection of control motors.

Electric Traction:-

Different systems of traction - Electric traction advantages and disadvantages - System of electric traction - Speed time curve - Mechanism of train movement - Motor for electric traction - Control of motors – Braking - Current collection gear - Train lighting system.

13. UTILIZATION OF ELECTRICAL ENERGY AND MANAGEMENT :-

Electric heating - Refrigeration and air conditioning - Electric welding - Electrochemical process - Illumination - Energy management and audit.