**ASSISTANT ENGINEER UNITED ELECTRICAL INDUSTRIES LIMITED(CATEGORY NO.73/2013) SYLLABUS**

**Module I**

Kirchhoff’s law-solution of series-parallel circuits-Magnetic circuits-mmf,flux,reluctance comparison of magnetic and electric circuits-Faraday’s laws Lenz’s law-statically and dynamically induced emf-self and mutual inductance-coefficient of coupling –single phase AC circuits-generation of sinusoidal emf-cycle.frequency,Time period-average and rms values-Form factor and peak factor of sine wave only-analysis of simple RLC circuits 1 reactance and impedance –active reactive and apparent power-power factor.3 phase circuits –generation of three phase AC voltage-star-delta connection-voltage & current relationships in star and delta ,Basic principle of operation of Transformers,DC generators & Motors

**Module II**

**Indication instrument-**Moving coil,moving iron,Dynamometer type wattmeter-principle & torque equation-classification of errors-errors in indicating instruments and compensation watt meter and energy meters-principle-torque equation-errors and compensation-static wattmeter and energy meters

**Module III**

**Basic Circuit Components:**Diode:Germanium,Silicon,Zener,LEDs(working principle only).Forward and reverse characteristics.Rectifiers:Half wave,full wave,Bridge circuits,DC power supply:Capacitor filter,Zener regulator,Transistors:Different configurations-CE characteristics-Beta,concept of Amplifiers:Common emitter RC coupled amplifier,Frequency response,Bandwidth.Comparison of BJT,FET,MOSFET,IGBT

**Module IV**

**Integrated circuits:**Advantages,classification of Linear and Digital ICs.Logic Gates,realization of logic functions,Basics of Op-amps,inverting and non inverting amplifiers

**Basic communication engineering:**Frequency bands :RF,VHF,UHF,Modulation-need for modulation,basic principles of AM,FM.Satellite Communication-Earth station ,transponder and receiver.Mobile Communication:basic principles of cellular communications,concepts of cells,frequency reuse,principle and block diagram of GSM

**Module V**

Thermodynamics-systems,properties,processes and cycles,zeroth,first and second laws-Carnot cycle-Efficiency of engine,COP of refrigerator.Two stroke and four stroke IC engines-working,comparison and applications-simple gas turbine unit-vapour compression refrigerating system.Window and split air conditioning.Hydraulic pumps and turbines.

Power transmission elements-rope,chain and belt drives.Gears and gear trains

**Module VI**

Materials and their properties.

Elementary ideas on manufacturing processes Elementary ideas on Machine tools-Lathe,shaper,planer,milling machine,drilling machine,grinding machine,CNC machines Functions of management-types of organizations,role of managers,planning process,productivity and inventory management,quality control,cost control.

**MODULE VII-ENGINEERING MECHANICS**

Basic Dimensions and Units.Vector and Scalar quantities.Principles of Statistics-Force Systems-Coplanar,Collinear,Concurrent and Parallel.Equilibrium of rigid bodies-free body diagrams.Forces in space:Equations of equilibrium.Fiction:Laws of friction angle of friction-cone of friction.Principle of Virtual work:Equilibrium of Ideal systems,stable and unstable equilibrium-Different types of supports,loads and beams-Reactions at supports.Shear force and Bending moment in beams.Kinetics:Newton’s laws of translator motion.Equation of motion.Work,Power and Energy-Work-Energy principle-Impulse,Momentum,Collision of elastic bodies –Law of conservation of momentum.Centrifugal and Centripetal Forces.Simple Harmonic Motion.Free Vibration Oscillations.Applications.

**MODULE VIII-BASIC CIVIL ENGINEERING**

Objectives,Principles & Types of Surveying.Levelling-Instuments & principles.Computation of Areas:Various rules.Basic principles of total station,remote sensing,GPS and GIS.Site Selection,Types of Buildings.Components of buildings.Foundation :Different types.Super Structure:Stone & Brick Masonry.Partition,Doors,Windows & Ventilators.Plastering & Painting-Types & materials.Flooring & Roofing-Types & Materials.Concrete:Ingredients-cement,aggregate and water.Test on Cement & Aggregates.Plain Cement Concrete(PCC),Reinforced Cement Concrete(RCC):-IS Specifications.Steel :Common types used in construction.Air,Soil and water Pollution.Waste management.Concept of Sustainable Buildings:Green buildings,intelligent building.Classification of Roads-Basic of Traffic Engineering.

**PART II:GENERAL KNOWLEDGE,CURRENT AFFAIRS& RENAISSANCE IN KERALA**

**Salient Features of Indian Constitution**

Salient Features of the Constitution-Preamble-its significance and its place in the interpretation of the Constitution.Fundamental Rights-Directive Principles of State Policy-Relation between Fundamental Rights and Directive Principles-Fundamental Duties.Executive-Legislature-Judiciary-Both at Union and State level-Other Constitutional Authorities.

Centre-State Relations-Legislative-Administrative and Financial.

Services under the Union and the States.

Emergency Provisions.

Amendment Provisions of the Constitution.

**Social Welfare Legislations and Programmes**

Social Service Legislations like Right to Information Act,Prevention of atrocities against Women & Children,Food Security Act,Environmental Acts etc.and Social Welfare Programmes like Employment Guarantee Programme,Organ and Blood Donation etc.

**RENAISSANCE IN KERALA**

**Towards A New Society**

Introduction to English education-various missionary organizations and their functioning founding of educational institutions,factories.printing press etc.

**Efforts To Reform The Society**

**A.Socio-Religious reform Movements**

SNDP Yogam Nair Service Society,Yogakshema Sabha,Sadhu Jana Paripalana Sangham,Vaala Samudaya Parishkarani Sabha,Samathwa Samajam,Islam Dharma Paripalana Sangham,Prathyaksha Raksha Daiva Sabha,Sahodara Prasthanam etc.

**B.Struggles and Social Revolts**

Upper cloth revolts .Channar agitation,Vaikom Sathyagraha,Guruvayoor Sathyagraha,Paliyam Sathyagraha.Kuttamkulam Sathyagraha,Temple Entry Proclamation,Temple Entry Act,Malayalee Memorial,Ezhava Memorial etc.Malabar riots,Civil Disobedience Movement,Abstention movement etc.

**Role of Press in Renaissance**

Malayalee,Swadeshabhimani,Vivekodayam,Mithavadi,Swaraj,Malayala Manorama,Bhashaposhini,Mathrubhoomi,Kerala Kaumudi,Samadarsi,Kesari,Al-Ameen,Prabhatham,Yukthivadi,etc

**Awakening Through Literature**

Novel,Drama,Poetry,Purogamana Sahithya Prasthanam,Nataka Prashtanam,Library movement etc

**Women And Social Change**

Parvathi Nenmenimangalam,Arya Pallam,AV Kuttimalu Amma,Lalitha Prabhu Akkamma Cheriyan,Anna Chandi,Lalithambika Antharjanam and others

**Leaders of Renaissance**

Thycaud Ayya Vaikundar,Sree Narayana Guru,Ayyan Kali.Chattampi Swamikal,Brahmananda Sivayogi,Vagbhadananda,Poikayil Yohannan(Kumara Guru)Dr palpu,Palakkunnath Abraham Malpan,Mampuram Thangal,Sahodaran Ayyappan,Pandit K P Karuppan,Pampadi John Joseph,Mannathu Padmanabhan,V T Bhattathirippad,Vakkom Abdul Khadar Maulavi,Makthi Thangal,Blessed Elias Kuriakose Chaavara,Barrister G P Pillai,T K Madhavan,Moorkoth Kumaran,C.Krishnan,K P Kesava Menon,Dr.Ayyathan Gopalan,C V Kunjuraman,Kuroor Neelakantan Namboothiripad,Velukkutty Aryan,K P Vellon,P K Chathan Master,K Kelappan,P.Krishna Pillai,A.K.Gopalan,T R Krishnaswami Iyer,C.Kesavan.Swami Ananda Theerthan,M C Joseph,Kuttippuzha Krishnapillai and others

**Literary Figures**

Kodungallur Kunhikkuttan Thampuran,Kerala Varma Valiyakoyi Thampuran,Kandathil Varghese Mappila.Kumaran Asan,Vallathol Narayana Menon,Ulloor S Parameswara Iyer,G Sankara Kurup,Changampuzha Krishna Pillai,Chandu Menon,Vaikom Muhammad Basheer.Kesav Dev,Thakazhi Sivasankara Pillai,Ponkunnam Varky,S K Pottakkad and others

**GENERAL KNOWLEDGE AND CURRENT AFFAIRS**

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