DETAILED SYLLABUS FOR THE POST OF

TECHNICAN GRADE II (ELECTRONICS)

IN KERALA CO-OPERATIVE MILK MARKETING FEDERATION LIMITED

(Category No: 075/2021)

1. Occupational hazards & Safety Precautions (Marks:4)

(a) Types of Fire, Fire extinguishers,personal protective equipments, First Aid for Electric Shock, Occupational Safety & Health,

2.Common Hand tools and Uses (Marks:2)

(a) Specifications, uses and maintenance of commonly used hand tools.

3. **Basic terms such as electric charges, Potential difference, Voltage, Current, Resistance. Basics of AC & DC. (Marks:8)**

(a) Attom, Electron,Proton,Electric Charge its unit,definition, (b)Potential difference, voltage, Resistance,Direct current,Alternating current, Various terms such as +ve cycle, -ve cycle, Frequency, Time period, RMS, Peak, Instantaneous value. Types of wires & cables, standard wire gauge (SWG).(c) ohms law, Kirchhoff's Law

4. **Introduction to electrical and electronic measuring instruments.(Marks:4)**

(a) Specifications and uses of commonly used electrical and electronic measuring instruments such as ammeter, voltmeter, Multimeter, MC and MI meters.

5. Cells and Batteries.(Marks :4)

(a) Construction, types of primary and secondary cells. Materials used, Specification of cells and batteries, Ah capacity, Series/ parallel connection of batteries and purpose of such connections

6. Active and Passive Electronic Components.(Marks :10)

(a) Resistors; types of resistors, their construction & specific use, color-coding, power rating.

Equivalent Resistance of series parallel circuits. Distribution of V & I in series parallel circuits.

(b) Principles of induction, inductive reactance. Types of inductors, construction, specifications, applications and energy storage concept. Self and Mutual induction. Behaviour of inductor at low and high frequencies. Series and parallel combination, Q factor.

(c) Capacitance and Capacitive Reactance, Impedance. Types of capacitors, construction, specifications and applications. Dielectric constant. Significance of Series parallel connection of capacitors. Capacitor behaviour with AC and DC. Concept of Time constant of a RC circuit. Concept of Resonance and its application in RC, RL & RLC series and parallel circuit. Properties of magnets and their materials, preparation of artificial magnets, significance of electromagnetism, types of cores. Transformers

7. Semiconductor materials, components, as Diodes and Zeners etc. (Marks 8)

(a) PN Junction, Forward and Reverse biasing of diodes. Interpretation of diode specifications.
Forward current and Reverse voltage
(b) Rectifier configurations, half wave ,full wave, Bridge their efficiencies, Filter components,
(c) Working principles of Zener diode, varactor diode, their specifications and applications. Regulated Power supply using 78XX series, 79XX series Integrated circuits

8. Semiconductor materials, components, as Diodes , Transistors, Integrated circuits (Marks 20)

(a) PN Junction, Forward and Reverse biasing of diodes. Interpretation of diode specifications.
Forward current and Reverse voltage .
(b) Rectifier configurations, half wave ,full wave, Bridge their efficiencies, Filter components,
(c) Working principles of Zener diode, varactor diode, their specifications and applications. Regulated Power supply using 78XX series, 79XX series Integrated circuits
(d) Construction, working of a PNP and NPN Transistors, purpose of E, B & C Terminals. Significance of α, β and relationship of a Transistor. Biasing of Transistor. Transistor applications as switch and amplifier. Transistor input and output characteristics. Classification of amplifiers, RC coupled amplifier, voltage gain, Feedback and its types. Astable, monostable, bistable multivibrator circuits using transistors.
(e) IC 555, functional description w.r.t. different configurations of IC 555 such as monostable, astable, IC741 Op-Amp circuits Inverting, Non-inverting Amplifiers.

9. Power Electronics, Sensors, Transducers and Applications,Inverter,UPS, Solar Power (Renewable Energy System) (Marks 20)
(a) Working of different power electronic components such as MOSFET,IGBT,SCR, TRIAC, DIAC and UJT.

(b) sensors used in process industries such as RTDs, Thermocouples, proximity switches (inductive, capacitive and photo electric), load cells, strain gauge. LVDT PT 100 (platinum resistance sensor), water level sensor, thermostat float switch, float valve

(c) Working principles of Inverter; principle of operation, block diagram, power rating, change over period. Concept of Uninterrupted power supply. Types of UPS : Off line UPS, On line UPS, Line interactive UPS & their comparison.

(d) Solar energy as a renewable resource. Materials used for solar cells. Principles of conversion of solar light into electricity. Basics of photovoltaic's cell. Module, panel and Arrays.

10. <u>Digital electronics, computer fundamentals, communication fundamentals and microcntroler (Marks 20)</u>

(a) Difference between analog and digital signals. Logic families and their comparison, logic levels of TTL and CMOS. Number systems (Decimal, binary, octal, Hexadecimal). BCD code, ASCII code and code conversions. Various Logic Gates and their truth tables, Combinational logic circuits such as Half Adder, Full adder, Concept of encoder and decoder,multiplexer , DE multiplexer, S-R Latch, Gated S-R Latch, D- Latch. Flip-Flop: Basic RS Flip Flop, D Flip Flop, JK Flip Flop, T Flip Flop. Master-Slave flip flops, Basics of Counters, types.

(b) Components of desktop and motherboard. Hardware and software, I/O devices, and their working. Different types of printers, HDD, DVD. Concept of Internet, Browsers, Websites, search engines, email, Network components like hub, Ethernet switch, router, NIC Cards, connectors,

(c) Radio Wave Propagation, Need for Modulation, types of modulation (AM,FM,PM) ,Digital communication, PCM,PWM,PPM

(d) Differentiate microcontroller with microprocessor.8051Microcontroller, architecture, pin details.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper