

**FURTHER DETAILS REGARDING MAIN TOPICS OF**

**PROGRAMME NO. 02/2016 (Item Nos. 13 & 14)**

**LABORATORY ASSISTANT (DAIRY/CFP)**

**KERALA CO-OPERATIVE MILK MARKETING FEDERATION  
LIMITED**

**(PART I – GENERAL CATEGORY & PART II – SOCIETY CATEGORY)**

**(CATEGORY Nos. 50/2013 & 51/2013)**

**PART I -BASIC CHEMISTRY**

Acids, bases, buffers, pH. Concentration units- normality, molality, molarity. Centrifugation. Surface tension. Viscosity. Colligative properties. Colloids. Chemical equilibrium. Electrochemistry. Spectroscopy- IR, UV-VIS, NMR, Raman and EPR. Chromatography- column, paper, TLC and LC. Thermodynamics. Chemical equilibrium.

**PART II - CHEMICAL ANALYSIS**

Physical properties and composition of milk, tests for milk quality, detection of impurities, detection of adulterants- water, antibiotics, pesticide residues, preservatives, colour additives, metals etc., determination of specific gravity, total solids, freezing point, titrable acidity, citric acid, lactic acid and SNF. Cattle feed analysis - moisture content, ash, fat, carbohydrate, crude fibre, crude protein, sodium, potassium, calcium, and phosphates.

**PART III - BASIC BIOCHEMISTRY**

Carbohydrates- glucose, galactose, disaccharides, polysaccharides – structure, properties, reactions and functions. Lipids- simple fat – fatty acids, triacylglycerols, phospholipids, cholesterol and complex lipids – glycoproteins, lipoproteins, chromoproteins - structure, properties and function. Amino acids and proteins- structure and properties, levels of structural organization of proteins, functional properties. Enzymes. Vitamins – fat soluble and water soluble, sources, functions. deficiency and symptoms. Minerals and salts. Digestion and absorption, intermediary metabolism. Nutritional aspects of micro and macromolecules.

**PART IV - BIOCHEMICAL ANALYSIS**

Qualitative and quantitative analysis of milk - Estimation of lactose, phosphorus, lactalbumin. Casein-preparation and estimation, total solids, calcium. Determination of ash, nitrogen, non-nitrogen, protein nitrogen, protein, fat. Fat extraction- hot and cold method. Antigens, antibodies, antigen- antibody interactions, ELISA, RIA, Immunofluorescence techniques, Western blotting.

**PART V - BASIC MICROBIOLOGY & TECHNIQUES**

History of Microbiology, techniques in Microbiology- microscopy- types of microscopes, advanced techniques in microscopy, specimen preparation for electron microscopy, staining

techniques- types and applications, sterilization techniques, culture media and culture methods. Tests for identification of bacteria. API system, Culture preservation techniques. Anatomy of microorganisms- prokaryotes and eukaryotes, structure of bacteria, fungi, algae and protozoans. Genetic materials in microorganisms, plasmids, reproduction in microorganisms. Viruses- morphological forms, classification, replication, major groups of animal viruses, viral cultivation methods, cytopathic effects, detection and assay of viral growth.

## **PART VI - FOOD MICROBIOLOGY AND MICROBIOLOGICAL ANALYSIS**

Microorganisms in food materials- sources of microorganisms in food, extrinsic and intrinsic factors influencing microbial growth in food, different types of food spoilage, food infections and food intoxications, mycotoxins- types and detection in food materials, microbiological analysis of water and food materials, fermented food products. Milk and dairy products- sources of microorganisms in milk, milk borne pathogens, microbial spoilage of milk and dairy products, microbiological analysis of milk and dairy products, techniques for preservation of milk- pasteurization, fermented milk products. Applications of antigen-antibody interaction for detection of microbes.

## **PART VII - BASIC BIOTECHNOLOGY**

Nucleic acids- structure, types. Replication, transcription, translation. Genetically modified crops – status and prospects. Environment pollution and control measures. Beneficial soil organisms. Bio-pesticides and biocontrol agents in integrated pest management. Single cell proteins. Therapeutic proteins - antibodies, enzymes, hormones, growth factors and vaccines. Application of enzymes in food industry. Intellectual property rights. Regulations for laboratory animal care and ethical requirements. Genomics, proteomics, metabolomics.

## **PART VIII - ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY**

Isolation and quantification of nucleic acids and proteins. Agarose gel electrophoresis - detection of nucleic acids on gels, staining techniques. Gel documentation. Polymerase chain reaction. Molecular Markers. Assessment of pesticide residues in milk, milk products, and animal fodder. Recombinant DNA technology- basic aspects. Commercial vaccine production. Nucleic acid probes and antibodies in detection of microbes and adulterants. Northern and Southern blotting techniques. Biosafety rules and regulations.

## **PART IX – 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 organisations 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. Malyalee Memorial, Ezhava Memorial etc.

Malabar riots, Civil Disobedience Movement, Abstention movement etc.

#### **Role Of Press In Renaissance**

Malayalee, Swadeshbhimani, Vivekodayam, Mithavadi, Swaraj, Malayala Manorama, Bhashaposhini, Mathnubhoomi, Kerala Kaumudi, Samadarsi, Kesari, AI-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, A V 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 Chaavra, Barrister G P Pillai, TK Madhavan, Moorkoth Kumaran, C. Krishnan, K P Kesava Menon, Dr.Ayyathan Gopalan, C V Kunjuraman, Kuroor Neelakantan Namboothiripad, Velukkutty Arayan, 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, KeralaVarma 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**

General Knowledge and Current Affairs

***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.***