

**FURTHER DETAILS REGARDING MAIN TOPICS OF
PROGRAMME NO. 02/2018/ONLINE (Item No.9)**

**LECTURER IN MICROBIOLOGY
COLLEGIATE EDUCATION**

(CATEGORY No.428/16)

PART -I

GENERAL KNOWLEDGE AND CURRENT AFFAIRS

General Knowledge and Current Affairs

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, Swadeshabhimani, 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

PART - II

I. 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.

II. 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.

PART -III

RESEARCH METHODOLOGY/TEACHING APTITUDE

I. TEACHING APTITUDE

- Teaching: Nature, objectives, characteristics and basic requirements;
- Learner's characteristics;
- Factors affecting teaching;
- Methods of teaching;
- Teaching aids;
- Evaluation systems.

II. RESEARCH APTITUDE

- Research: Meaning, Characteristics and types;
- Steps of research;
- Methods of research;
- Research Ethics;
- Paper, article, workshop, seminar, conference and symposium;
- Thesis writing: its characteristics and format.

PART- IV

MODULE -1

Principles of bacterial taxonomy, Morphology and ultra structure of bacteria. Identification of bacteria biochemical tests, Molecular methods for identification Intraspecies classification of bacteria, Molecular typing methods factors influencing microbial growth. Nutritional types of bacteria. Microbial growth curve Measurement of bacterial growth. Bacterial motility mechanisms, Bacterial photosynthesis.

MODULE-II

Sterilisation – Principles and methods, physical and chemical methods. Disinfectants – mode of action, Testing of disinfectants, Cultivation of bacteria – culture media. Aerobic and Anaerobic culture methods. Culture preservation techniques, Antibiotics – mechanism of action. Drug resistance in bacteria. Antibiotic sensitivity tests.

MODULE-III

Infection and immunity, Organs and cells with immune functions. Lymphocytes and lymphocyte maturation. Antigens, Antibodies, Immunoglobulin – structure, classes and functions. Genetic basis of antibody diversity, Antigen-antibody reactions, Immune response – humoral and cell mediated, Factors influencing antibody production, Clonal selection theory, Monoclonal antibodies, Complement system, Complement activation, Biological effects of complements, Methods of immunoprophylaxis, vaccines.

MODULE – IV

Study of important properties, pathogenicity and laboratory identification of bacteria viz. *Staphylococci*, *Streptococci*, *Neisseria*, *Corynebacterium diphtheriae*, *Clostridium*, *E-coli*, *Shigella*, *Salmonella*, *Vibrio cholerae*, *Mycobacterium*, *Leptospira* and *Treponema pallidum*

MODULE-V

General structure of viruses, Cultivation of viruses. A brief study of the properties of the important human viruses viz. V-Z virus, Polio, Rabies, Influenza, Hepatitis and HIV-Pathogenesis and laboratory diagnosis of diseases caused by these viruses, Mycoses in man – pathogenesis and laboratory diagnosis of various superficial, cutaneous, subcutaneous and systemic fungal infections. A brief study on *Entamoeba histolytica* and *Plasmodium*.

MODULE - VI

Microbes associated with food, Factors influencing microbial growth in food, Intrinsic and extrinsic factors, Microbial spoilage of food, microbial examination of food, Microbiological examination in milk, Food borne infections and intoxications. Food preservation and preservatives, Physical and Chemical methods of preservation, SCP, Probiotics.

MODULE – VII

Microbial fermentation: Isolation and screening of industrially useful microorganisms, Fermenter design and construction, Microbial processes for the production of alcoholic beverages, citric acid, acetic acid, lactic acid, penicillin. Biological treatment of industrial waste water, Treatment strategies primary, secondary and tertiary treatment. Aerobic and anaerobic methods.

MODULE – VIII

Factors influencing soil microflora. Microbial interactions in soil Mycorrhiza, Role of microorganisms in the cycling of elements (C, N, P, S). Biofertilizers and biopesticides, Microbiological aspects of biogas production, Microbial bioremediation. Microbiology of water – Potability of water. Indicator organisms, Microbiological examination of drinking water. Purification and disinfection of water.

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.

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