

**FURTHER DETAILS REGARDING MAIN TOPICS OF  
PROGRAMME No. 12/2016 (Item No. 13)  
LABORATORY TECHNICIAN GRADE II/ LABORATORY  
ASSISTANT GRADE II  
ANIMAL HUSBANDRY DEPARTMENT  
(CATEGORY No.240/2015)**

**MODULE I**

**UNIT I**

**VETERINARY PARASITOLOGY**

Introduction to Clinical Parasitology, laboratory- Microscopy- Basic concepts in Veterinary helminthology, entomology, acarology and protozoology. Handling of equipments routinely used in lab like centrifuges, weighing balances, glass and plastic ware etc. Preparation of stains, like Hematoxylin stains, Acetic acid carmine, ZN carbol fuchsin, fixatives like 10% formalin, Boiu's fluid, Carnoy's fluid, Schaudinn's fixative etc and mounting media like lactophenol, glycerol, Preparation of sporulation solution, etc.-

Techniques of collection of clinical materials including faeces, blood and urine-preparation of solutions and scientific handling of clinical samples-Collection and preservation of clinical materials as well as parasite specimens obtained, antemortem and post mortem-acquaintance with specimen maintenance.

Diagnostic morphological features of nematodes, trematodes, cestodes affecting animals, flies, fleas, lice, bugs, ticks and mites affecting animals-life cycle stages of helminths with special emphasis to demonstrable stages of parasitic helminths- Processing of samples, identification of ova of helminths in faeces, urine, nasal discharges etc.- Methods for identification helminth larvae from blood samples by Knott's technique and histochemical staining. Micrometry- copro culture techniques and copro antigens- Detection of Anthelmintic resistance, Preparation of temporary and permanent mount of helminths. Fecal egg count reduction test and Egg hatch assay.

Role of vectors in disease transmission-collection, processing, identification and preparation of permanent mounts-Xenodiagnosis- examination of skin scrapings-identification of adults and developing stages-processing and preservation of arthropods in dry and wet mounts.

Temporary and permanent staining techniques of tissue protozoa including iodine staining, Heidenhan's Iron Haematoxylin staining- preparation of blood smear, buffy coat smear, lymph node smear-Quantitative buffy coat system-wet film examination-Diagnostic morphological features of different classes of haemoprotozoa and protozoa like *Giardia*, *Entamoeba* and *Balantidium coli* -coccidiosis - cryptosporidiosis - avian malaria- *Haemoproteus columbae*, babesiosis- theileriosis -toxoplasmosis and sarcocystis -Identification of diagnostic stages from secretions and excretions using conventional methods-recent trends in protozoan disease diagnosis from faecal smears- basic serological tests- basic immuno parasitological techniques- Lab animal inoculation for diseases like trypanosomosis, leishmanosis in animals, throat swab examination for trichomonosis in pigeon.

**UNIT II**

**VETERINARY PATHOLOGY**

General introduction to hematology, Preparation of site and Collection of blood from different species, anticoagulants, separation of serum, TEC, TLC, DLC, ESR, PCV, Hb, Erythrocyte indices, Reticulocytes, Platelet count, Bleeding time and Clotting time, DLC – Staining – Common stains for hematology-Peculiarities of animal blood evaluation

Collection, Preservation & despatch of clinical materials like urine, milk and semen. Physical, Chemical and Microscopical examination of urine, milk and semen. Serum biochemistry-serum enzymes and electrolytes, blood sugar, serum proteins. Evaluation of serum enzymes like AST, ALT, ALP, Serum bilirubin, serum protein, sugar, Sodium, Potassium, Copper, Calcium, Urea etc.-Function tests of liver and kidney

Urinalysis- routine chemical tests, microscopical examination of sediments, Milk –various tests for mastitis, cell counts, chloride tests, white side test, California mastitis test, milk culture and antibiotic sensitivity test. Semen-, physical and microscopic examination, Preparation of semen smears and staining.

Preservation of postmortem samples and biopsies, fixatives, documentation, cytology. Histopathology- Techniques in histopathology-Processing of tissues, section cutting, Staining, Preparation of specimens for cytology

General Principles of staining, Factors influencing staining –Simple stains, compound stains, Special stain, Classification of stain, Preparation of stains and slides, Staining procedures. Mounting, Labelling and Storage of slides, Inventory management of chemicals, Museum technology / preparation.

### **UNIT III**

#### **VETERINARY MICROBIOLOGY**

Good laboratory practices, Sterilisation- Definition and methods, Microscopy- types of microscope- handling of microscope, staining – type of stains- staining techniques, Definition of culture media- ingredients of culture media- different types of media- preparation of media- sterility check and storage, introduction to lab animals- handling, care and management of lab animals.

Preparation of stains, different staining techniques- Gram's staining, acid fast staining, Leishman's staining, Wright's staining, Lactophenol cotton blue staining, preparation and use of culture media- inoculation of culture and incubation, preparation of bacterial smears on slides, antibiotic sensitivity tests.

Definition-defense mechanisms of body, infections caused by bacteria, virus and fungus – nosocomial and iatrogenic infections, list of zoonotic diseases-clinical samples to be collected in each disease–Sample, preservation and transport of clinical specimens-processing of clinical specimens.

Collection of clinical samples like blood, faeces, sputum, nasal swab, vaginal swab, serum separation and storage, blood collection from different species of animals including lab animals preparation of reagents for the storage of specimens, processing of clinical samples

Basic principles of disease diagnosis, diagnosis of bacterial infections, viral and fungal infections, isolation of the agent, identification of the agent using different culture media, staining techniques, and biochemical characterization, introduction to egg inoculation and cell culture like agglutination, precipitation, ELISA, AGID, FAT, CFT, lateral flow techniques, introduction to recent advances in molecular methods like PCR, different types of PCR, ribotyping etc., animal inoculation.

Isolation of bacteria from clinical samples, identification by colony morphology, staining, biochemical tests, isolation and identification of fungus, demonstration of serological and molecular techniques, methods of animal inoculation.

#### **UNIT IV**

##### **QUALITY CONTROL MEASURES IN FOOD INDUSTRY**

Definition-quality control, quality assurance, quality management, microbiological guidelines, specifications and standards, National agencies associated with quality control- BIS, PFA, MMPO, MFPO, AGMARK, International agencies associated with quality control, - codex alimentarius, FAO, WHO- quality control systems in food industry- HACCP, BPS, TQM, ISO series salient features, quality control tests used in food industry.

Collection and processing of the sample for quality control tests, analysis of water- physical, chemical and microbiological, milk- rapid platform tests- direct and indirect quality control tests, analysis of meat- physical, chemical and microbiological, air – sampling and analysis.

#### **UNIT V**

##### **GENERAL LABORATORY TECHNIQUES**

Organization of a laboratory; specimen collection, handling, entry, containers, transport; storage of chemicals and reagents: common dangers/accidents in the lab ;principles and methods of quality control: principles, uses and maintenance of centrifuge, calorimeter, balance, refrigerator, water bath, glass wares, photometer, microscopes, autoclave, microtome, tissue processor; pipettes: preparation of distilled water.

#### **UNIT VI**

##### **HAEMATOLOGY, CLINICAL PATHOLOGY & HISTOTECHNOLOGY**

Haemopoiesis, Functions and estimation of Haemoglobin, Blood collection techniques, Anticoagulants, Blood cell counting, Blood smear and their Staining; Anaemia, Leukemia, PCV, ESR, Bleeding and Clotting time, Urine analysis-Physical, Chemical, Microscopy; Stool examination for ova, blood; Fixatives, Microtomy; Decalcification, Tissue processing ;H and E staining; Pap staining.

#### **UNIT VII**

##### **GENERAL BIOCHEMISTRY**

Methods of measuring liquids and weighing solids; volumetric analysis; Preparation of standard solution; cleaning and preparation of laboratory glasswares; molar and percent solution; Carbohydrates- glycolysis, hormonal regulations of blood sugar, glycosuria, Ketosis; Lipids-

Triglycerides, Cholesterol, lipoproteins. Protein: Basics of amino acids, Formation of Urea, creatinine, creatine, transaminases: proteinuria; electrolyte analysis; calorimetry.

## **UNIT VIII**

### **General Microbiology**

Rules of lab safety; sterilization and disinfection methods (dry and moist heat); Antiseptics: cross infection: Culture media- composition preparation and storage: anerobic and anaerobic culture methods. Simple and differential staining: common cocci and bacilli: mycoplasma: Chlamydia: collection of different specimens and their transport: Use of preservatives and transport media- Antibiotic susceptibility testing, basic biochemical characterization tests and serological tests- Widal, Coomb's , VDRL, RPR, ELISA; KOH preparation; AFB staining, gram's staining.

***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.***