Tamil Nadu Public Service Commission

Syllabus

Animal Husbandry and Veterinary Science

(PG Degree Standard)

Code: 397

Unit I: General: (10 Questions)

Role livestock management - food security - Livestock Population Census in the nation and state - Policy note on Animal Husbandry, Government of Tamil Nadu – Current Livestock Development programs and polices of State and Nation - Legislation for control of animal diseases - Legal duties of Veterinarian - Common offences against animals and laws governing import and export of animals - Certification of products - Drugs and Cosmetic Act 1940,Good Manufacturing practices of veterinary biologicals, Basic knowledge on Institutional Bio safety Committee (IBSC), Committee for the control and supervision of experimentation on animals (CCSEA) and Animal Welfare Board (AWB). Contribution of Livestock sector to National and State Economy. WTO, TRIPS, IPR and their impact on livestock sector. Export and import of livestock and livestock products.

Unit II: Animal Breeding and Genetics, Animal Nutrition and Livestock Production Management (20 Questions)

Animal Breeding and Genetics (5 Questions)

Important breeds of cattle, buffalo, sheep, goat, pig and poultry with special reference to economic characters - Principles of Genetics and Cytogenetics - Basis of Population Genetics – Hardy-Weinberg Law, Effects of selection, migration, mutation, genetic drift and inbreeding on gene and genotype frequencies, Effective Population Size, Genetic parameters - Animal Breeding: Aids to selection, methods of selection and culling, Sire Evaluation & Breeding value estimation, Field Progeny Testing, Response to selection. Methods of breeding – Inbreeding and outbreeding – Nucleus Breeding Systems, Synthetic breed formation, selection for combining ability in poultry - Molecular techniques and their applications in Animal Breeding including DNA chips and selection of High Genetic Merit breeding stock - Current livestock and poultry breeding policies and programmes in the state and country - Wild animal breeding in captivity. Pet animals and birds – breeds and breeding - Laboratory Animal Breeding - Conservation of Animal Genetic Resources.

Animal Nutrition (10 Questions)

Nutritional terms and definitions - Proximate composition and fibre fractions of feeds - Digestion and metabolism of nutrients in ruminants and non-ruminants. Importance of minerals and Vitamins in ruminants & non ruminants - Classification of feeds and fodders, antinutritional factors - Storage and conservation of feeds and fodders – Formulation of rations and feeding of Livestock, Poultry, Laboratory and pet animals - Utilisation of unconventional feeds, Industrial and animal by - products - Wild life nutrition. Use of feed additives. Feed milling technology - Laws and regulations of feed manufacturing industry, Codex alimentarius, HACCP. Therapeutic diets for pet animals - Feeding of animals during disaster- Hydrophonic fodder - nanonutrients in animal production.

Livestock Production Management (5 Questions)

Common terms used in Animal Husbandry - Identification, Dentition and Age of animals – Watering livestock - Removal and disposal of manure and other animal waste – Disposal of carcasses and bio medical waste - Effect of environment on the health and productivity of livestock and measures to counteract it - Different systems of housing, enriched housing models, environmental controlled housing for livestock, Housing considerations for various classes of livestock with special reference

to laboratory animals -Scientific techniques and regime of feeding and watering different categories of livestock - Traits of economic importance and their inter-relationships - labour management - clean milk production - management strategies different classes of livestock - Indices to assess the reproductive efficiency - Milk parlour systems - laws and practices governing dairy sector in India - Draught animal power - Climatology and livestock production - THSI index - effect of photo period on livestock productivity - Livestock and global warming - Behaviour and Animal Welfare - Significance of laboratory animal production and management - Management of companion animals and its management strategies - Economic importance of integrated farming system - Hatchery management - Different systems of poultry management - sexing and brooding of chicks - Common symptoms of diseases and control measures - Farm record maintenance.

Unit-III: Livestock Products Technology (Dairy Science and Meat Science) (10 Questions)

Livestock Products Technology (Dairy Science) (5 Questions)

Retrospect and prospects of milk industry in India - Layout of milk processing plant and its management - Composition and nutritive value of milk - factors affecting milk composition. Physico-chemical properties of milk. Collection, chilling, standardization, pasteurization, UHT treatment, homogenization, and bactofugation. Preparation of cream, butter, ghee, channa, paneer, khoa, ice cream, dahi, lassi, mozzarella cheese, and dairy by- products - Dried, dehydrated and fermented milk - Introduction to functional milk products - Organic milk products. Common defects of milk products and their remedial measures - Microbiological deterioration of milk and milk products - Packaging, transportation, storage and distribution of milk and milk products - Good manufacturing practices and implementation of HACCP in milk plant - Food safety standards for milk and milk products - Cleaning and sanitation in milk plant - Dairy effluent management - Sampling of milk - Platform tests - Estimation of fat, solid not fat (SNF) and total solids - Cream separation - Detection of adulteration of milk - Determination of efficiency of pasteurization. Role of milk and milk products in human nutrition, Detection of adulterants in milk. Food safety Norms FSSAI.

Livestock Products Technology (Meat Science) (5 Questions)

Layout and management of rural, urban, and modern abattoirs. HACCP concepts in abattoir management. Animal welfare and pre-slaughter care of meat animals. Significance of Meat Inspection in Wholesome Meat Production Procedures of antemortem and post-mortem examination of meat animals. Slaughtering and dressing of meat animals and birds. Importance of evaluation of meat animals and grading their carcasses. Utilization of abattoir byproducts, rendering, and treatment of condemned meat and carcasses. Management of effluent emanating from abattoir. The prospect of the meat industry in India. Structure and composition of muscle. Conversion of muscle to meat. Nutritive value of meat. Fraudulent substitution of meat. Preservation of meat and poultry; drying, salting, curing, smoking, chilling, freezing, canning, irradiation, and chemicals. Aging of meat. Modern processing technologies of meat and meat products. Concept of value addition – Importance of value addition in the meat industry. Physico-chemical and microbiological quality of meat and its products. Nutritive value of egg. FSSAI, Codex Alimentarius Commission rules, and regulations pertaining to meat.

Unit IV: Animal Husbandry Extension and Economics (10 Questions)

Principles of extension education - Extension teaching methods, Audio visual aids - Characteristics of rural & urban societies. Diffusion of innovations, Innovation decision process, Adopter categories and factors influencing adoption of technologies, Panchayat Raj. Selection and training of leaders. Extension programme planning and evaluation. Principles and elements of animal husbandry extension management. Human resource management in the animal husbandry sector. ICT initiatives in Livestock Sector, State and Central Governmental Schemes - Role of animals in the economy of livestock owners. Statistics of animal and poultry – National and State wise. Milk and sheep co-operatives - Marketing of livestock and its products. Preparation of feasibility reports

and projects (Economics of a dairy unit, poultry, piggery, sheep & goat units). Per capita availability and consumption of milk, meat and egg. Impact of AH programs in the state. Livestock entrepreneurship, avenues and job opportunities.

UNIT V: Veterinary Anatomy and Physiology (20 Questions)

Veterinary Anatomy (10 Questions)

Gross study of bones of Ox and differences in Horse, Dog, Pig and Fowl, Palpable bony prominences of body of domestic animals, joints and muscles of skeleton of Ox. Gross study of heart and its conduction system, General plan of Pulmonary and systemic circulation, Palpable lymph nodes and arteries of the body of domestic animals. Surface veins for Venepuncture, Gross anatomy of Brain and Spinal cord, Gross study of organs of digestive, respiratory, urinary and reproductive system of Ox, Horse, Dog, Pig and Fowl, Systemic histology.

Veterinary Physiology (10 Questions)

Digestion, metabolism and absorption of carbohydrates, proteins and fats in simple stomach animals and ruminants - mechanism of respiration. General functions of blood (blood cells, plasma & serum) coagulation, blood groups in animals, cardiac cycle,Blood circulation, Blood pressure, renal function. Hormonal control of Lactogenesis. Endocrine control of Physiological system and application of hormones on Production-Renal System - Significance of Avian Excretory System - Physiological Significance of Avian Respiration - Stress Physiology - Mode of Stress management by body - Immune responses and Immune Physiology.

Unit VI: Surgery & Radiology (5 Questions)

General surgical principles - Asepsis and Antisepsis - sutures and suturing methods - Pre medication and Anaesthesia (Local Regional and General) in small and large animals – Anesthetic Monitoring - Anesthetic Emergencies and management - Anesthesia of wild and captive animals. Aural Hematoma in dogs - Small Animal GI tract surgical affections - Esophageal foreign Body – GDV – Intussusception - Foreign body syndrome – Megacolon - Ophthalmic affections in small animals - Amputation of tail - Large Animal GI tract affections - Choke – Rumenotomy - Abomasal Affections - Cecal Dilation and Torsion- Atresia Ani- Urogenital affections in small and large animals –Cystotomy – Uretherotomy - Pernieal Uretherostomy - Tube Cystotomy. Orthopaedic Examination of Small Animals - Principles of Internal Fixation - including pinning, plating and external skeletal fixators. Fracture and its complications - Osteoarthritis and Hip Dysplasia - Patellar luxation in small animals - Spinal cord affections and its surgical management. Conformation of Horses - Lameness examination in large animals - Hoof affections on horses and cattle - musculoskeletal diseases -Principles of fracture fixation in large animals. Common surgical affections and operative procedures (Wound, Fracture, and dislocation) – cosmetic surgical operations - Imaging techniques Principles of radiographic interpretation - Ultrasound diagnostic imaging – CT Scan and MRI techniques. Pre-operative and post-operative care of animals - Intensive care - Physiotherapy - Diathermy – Surgical Emergencies.

Unit VII: Gynaecology and Obstetrics (5 Questions)

Role of hormones in various phases of reproduction in female & male - Symptoms of estrus and estrous cycle - Embryo Transfer Technology - Fertility and infertility in female&male, diagnosis and treatment - Pregnancy diagnosis - Diseases and accidents during gestation, Abortion - Causes and treatment, Stages of parturition in domestic animals - Types of dystocia, handling, diagnosis and treatment, post-partum diseases, and complications - Collection and evaluation and preservation of semen - Handling of frozen semen - Techniques of AI - Breeding soundness examination of bulls - Castrationin different species.In-vitro fertilization - Transgenic animal production - Sexing of gametes and embryos - Herdhealth improvement program.

Unit VIII: Veterinary Microbiology and Preventive Medicine (60 Questions)

Veterinary Microbiology (30 Questions)

General Microbiology - Microscopy - Bacterial growth, Nutrition, metabolism - Bacterial Genetics - Determinants and pathogenicity markers - bacteriophages - antimicrobial agents - resistance and susceptibility. Morphological structure of virus - classification of virus Replication of DNA & RNA viruses - Viral Interactions, pathogenesis, persistence, oncogenic virus - Immune response to viral infections. Systematic veterinary Bacteriology and Virology Bacterial and Viral diseases of veterinary importance - etiology, antigenic and structural components, pathogenesis, Diagnosis, and control – Prions, emerging & transboundary diseases. Veterinary immunology - Poultry & livestock immune system - types of immunity- Organs and cells of Immune system - Antigens and its characteristics - Immunoglobulins - MHC – Hypersensitivity – Antigen-antibody Interaction – Immunological diseases - Veterinary Vaccine, Quality control recent advances in Vaccine delivery - Adjuvants – Vaccine failure. Veterinary Mycology, morphology, cultural characters - virulence factors - Antigenic components - pathogenesis - Diagnosis and control of fungal infection - Systematic study & animal mycoses.

Veterinary Preventive Medicine (30 Questions)

Epidemiology – definitions, terms, triad, concept, scope, objectives, and uses. Monitoring and surveillance, epidemiological disciplines - investigations, methods, mode and route of disease transmission, observational studies, rates, ratios, occurrence of disease, properties of diagnostic tests, gradient of infection, pattern of diseases, survey, Data collection and ecosystem. Epidemiology, aetiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, treatment, prevention and control of common bacterial, viral, fungal, rickettsial, protozoan and parasitic diseases (ecto and endo) of livestock, poultry, companion animals and wild life species, regional - emerging and re- emerging important diseases, notifiable diseases, Allergic skin tests – Intradermal tests, and recent serology and molecular diagnostic techniques - disease outbreak investigations and vaccines - quality control - vaccination protocol for infectious diseases of livestock, poultry and pet animals – World Organisation for Animal Health

Unit IX: Veterinary Pathology and Parasitology (35 Questions)
Veterinary Pathology (20 Questions)

General Pathology: Causes of diseases - Neoplasm - Disturbances of cell metabolism and growth. Systemic Pathology: Cardio vascular, respiratory, digestive, genital, nervous and skin. Pathology of important diseases caused by bacteria, virus, fungi, helminths and protozoa in livestock and poultry. Clinical Pathology: Examination of clinical materials, post mortem techniques**,** vetro – Legal implications - Collection and despatch of materials. Preservation of specimens.

Veterinary Parasitology (15 Questions)

Classification of parasites - General life cycle, mode of transmission, pathogenesis, diagnosis and control of Trematodes, Cestodes, Nematodes, arthropods and Protozoa in animals and birds. Use and abuse of antiparasitic drug, anti-parasitic drug resistance, Parasites of zoonotic importance - Anti-parasitic vaccines.

Unit X: Veterinary Clinical Medicine and Veterinary Pharmacology & Toxicology (25 Questions)

Veterinary Clinical Medicine (10 Questions)

General - Special and systemic clinical examinations - Clinical diagnostic techniques -Diseases of digestive system, cardiovascular, respiratory, urinary, nervous, musculoskeletal, hemopoietic, mammary gland ,skin and sense organs - Etiology, clinical signs, pathogenesis, diagnosis,

treatment , prevention and control of metabolic diseases and deficiency diseases (Minerals and vitamins) – Diseases of toxicants - Fluid therapy including blood transfusion - emergency and critical care medicine - Ethics and jurisprudence in domestic and wild animals - Interpretation of laboratory results.

Veterinary Pharmacology and Toxicology (15 Questions)

Drug action - Pharmacokinetics (absorption, distribution, biotransformation and excretion), Pharmacodynamics - Local and general anaesthetics - Antibiotics and chemotherapy – Toxicology, Ethno veterinary medicine. Pharmacy – Preparation of ointments liniments and injectable - Dispensing of pharmaceutical preparations. Pharmacokinetics (absorption, distribution, biotransformation, excretion) – Pharmacodynamics (structure and function of receptors, dose-response curve) – Anaesthetics (local and general), sedatives, analgesics - chemotherapy (general principles including resistance, antibacterials, anthelmintics, antiprotozoal) – Toxicology (General principles of treatment of poisoning, antidotes, toxicity of pesticides, herbs, venoms, and toxins) – herbal drugs in veterinary practice – Pharmacy (calculations, prescription writing, drug approval process)

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