

Part (II) : - General Technical Subject (50 Marks)

1. **Introduction** **10%**
 - 1.1 History and current status of veterinary services in Nepal
 - 1.2 Current status of livestock production and production systems of livestock and poultry in Nepal
 - 1.3 Indigenous and exotic breeds of livestock and poultry and their population in Nepal
 - 1.4 Role of public and private sector in the promotion of veterinary services in Nepal
 - 1.5 Recent GoN policies and plans related to livestock development
 - 1.6 Provisions made by APP, Livestock Master Plan and Dairy Development Plan for Livestock sector development

2. **Clinical subjects** **40%**
 - 2.1 **Veterinary Medicine**
 - 2.1.1 Distinguish between health and disease, General clinical examinations of animals, Normal physiological values like body temperature, rectal temperature, heart rates, respiratory rates, urinary volume and fecal output of different species of animals
 - 2.1.2 Systemic disease: Etiology, diagnosis and treatment of: Disease of Blood, lymphatic and cardiovascular system, Disease of Digestive system, Common disease of eye and ear, Disease of Endocrine system, Disease of Nervous system, Disease of Reproductive and urinary system, Disease of Respiratory system, Disease of Skin
 - 2.1.3 Metabolic and production diseases
 - 2.1.4 Nutritional deficiencies disease
 - 2.1.5 Trans-boundary animal disease (TADs): Definition, etiology, epidemiology, transmission, pathogenesis, symptoms, diagnosis, treatment, control and prevention of the following TADs: FMD; RP; PPR; CBPP; Sheep pox and Goat pox; Blue tongue; Classical swine fever; Highly Pathogenic Avian Influenza; New castle disease
 - 2.1.6 Other Infectious disease: Definition, etiology, epidemiology, transmission, pathogenesis, symptoms, diagnosis, treatment, control of the following infectious disease: HS; BQ; Malignant edema; Tetanus; Anthrax; Tuberculosis; Paratuberculosis; Actinomyces; Actinobacillosis; Brucellosis; Listeriosis; Leptospirosis; Mastitis; Strangles; Glanders; Degnala disease; Salmonellosis; Mycoplasmosis; Mad cow disease; Rabies; Scrapie; Canine distemper;
 - 2.1.7 Etiology, epidemiology, transmission, pathogenesis, symptoms, diagnosis, treatment, and control of the common disease caused by chlymedia, Ricktesia and Fungi in different species of animals
 - 2.1.8 Disease of Poultry: Definition, etiology, epidemiology, transmission, , pathogenesis, symptoms, diagnosis, treatment, control of the following poultry disease: Fowl pox; Fowl Typhoid; BWD; CRD; Infectious bursal disease; Infectious bronchitis; Marek's disease; Avian leucosis complex; Egg drop syndrome; Leechy heart disease; Fowl cholera; Aflatoxicosis
 - 2.1.9 Parasitic disease: Etiology, epidemiology, transmission, pathogenesis, symptoms, diagnosis, treatment, control of the following parasitic disease
Helminthic parasitic disease: LF; Paramphistomiasis; Ascariasis; G.I. Nematodiasis; Tape worm infection in different species of animals. ecto-parasitism, General control measures of Gastro intestinal parasitism in

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animals. Protozoan diseases: Anaplasmosis; Babesiosis; Theileriosis; Trypanosomiasis; Toxoplasmosis; and Coccidiosis

- 2.1.10 Diagnosis, treatment and management of different form of poisonings and snake bite
- 2.1.11 Prospects and constrains of animal and poultry vaccine production in Nepal, their uses and abuses

2.2 Veterinary Surgery

- 2.2.1 General surgical principles and procedures adopted in surgery
- 2.2.2 Pre and post operative considerations
- 2.2.3 Antiseptics and disinfectants
- 2.2.4 Sterilizations of surgical materials and instruments.
- 2.2.5 Importance of sutures and suturing materials
- 2.2.6 Inflammations; Abscess; Tumors; Cysts; Heamatoma; Hernia and their treatment
- 2.2.7 Different types of wounds and their treatment
- 2.2.8 Gangrene; Burn, Scald; Frost bite and their treatment
- 2.2.9 Fractures and dislocations, their diagnosis and treatment
- 2.2.10 Special surgery; Caesarian section; Rumenotomy; Ovario-histerectomy, Stringhalt; Spaying and Neutering
- 2.2.11 Different types of local , regional and general anesthetic procedures

2.3 Veterinary obstetrics and Gynecology

- 2.3.1 Normal reproductive cycle of different farm animals and dogs.
- 2.3.2 Breeding soundness examination of bull
- 2.3.3 Detection of heat
- 2.3.4 Artificial insemination
- 2.3.5 Pregnancy diagnosis
- 2.3.6 Embryo transfer
- 2.3.7 Concept of infertility and sterility
- 2.3.8 Diagnosis and treatment of silent estrus, an-estrus, repeat breeders metritis, endometritis and pyometra
- 2.3.9 Dystokia and its correction
- 2.3.10 Prolapse of uterus, bladder and vagina
- 2.3.11 Use of hormones and prostaglandins
- 2.3.12 Infectious disease causing abortions

2.4 Epidemiology and Veterinary public health

- 2.4.1 Definition, aim, objectives and application of epidemiology
- 2.4.2 Epidemiological concept of disease control
- 2.4.3 Surveillance and monitoring of disease
- 2.4.4 Different types of epidemiological studies
- 2.4.5 Outbreak investigation
- 2.4.6 Prevalence rate, incidence rate and difference between them
- 2.4.7 Characteristics of host factor, agent factor and environmental factor
- 2.4.8 Different terminology used in epidemiology
- 2.4.9 Epidemiological reporting practices in Nepal
- 2.4.10 Cost analysis of the disease control programs
- 2.4.11 Risk analysis
- 2.4.12 Definition and objective of VPH
- 2.4.13 Different roles of VPH (Animal production, food hygiene and environmental protection)
- 2.4.14 Diagnosis , surveillance and control of various zoonotic disease

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- 2.4.15 Meat inspection: anti-mortem, post-mortem and re-inspection
- 2.4.16 Different component and management of slaughterhouse
- 2.4.17 Milk hygiene
- 2.4.18 Concept of HACCP (Hazard analysis and critical control point)

2.5 Veterinary extension

- 2.5.1 Definition, philosophy and principles of extension education
- 2.5.2 Classification of extension teaching methods
- 2.5.3 Public private partnership
- 2.5.4 Social mobilization (CBOs, NGOs, and INGOs)

2.6 Clinical pathology and parasitology

- 2.6.1 Materials to be sent to laboratory for different disease diagnosis
- 2.6.2 Hematological examinations (TC, DC, ESR, PCV, RBC count, Blood smears, hemoglobin estimation)
- 2.6.3 Blood chemistry (estimation of blood glucose, serum and calcium)
- 2.6.4 Liver and kidney functions tests
- 2.6.5 Urine analysis (Routine test, test for detection of protein, Glucose, Ketone bodies, blood, bile pigment)
- 2.6.6 Blood and urine culture and antibiotic sensitivity tests
- 2.6.7 California mastitis tests
- 2.6.8 Important diagnostic tests: Different staining procedures, Tuberculin tests in animals, Test for pullorum disease (Rapid stained antigen), Brucellosis tests (RBPT and milk ring test) Test for rabies (Negri bodies test)
- 2.6.9 Post mortem examinations
- 2.6.10 Clinical parasitology (Examination of feces: direct smear method, concentration method and Floatation method)
- 2.6.11 Examination of skin scrapping
- 2.6.12 Bacterial, Viral and Fungal serological techniques
- 2.6.13 ELISA

3. Para-clinical subjects

20%

3.1 Veterinary Microbiology

- 3.1.1 General characteristics, properties, morphology, metabolism, growth and reproduction of bacteria, virus and fungus of various classes
- 3.1.2 Bacterial genetics, mutation and variations associated with virulence
- 3.1.3 Antigenicity, drug resistance
- 3.1.4 Principles of antiseptics, sterilization and disinfection
- 3.1.5 Resistance and immunity, antigen-antibody reaction and methods of detection Cell mediated and humoral immunity and immune mechanism. Immune system and its development. Antigen-antibody reactions
- 3.1.6 Immunization of animals
- 3.1.7 Hypersensitivity-allergy
- 3.1.8 Bacteriophage, their description and application
- 3.1.9 Laboratory techniques for bacterial, viral, fungal culture and identification
- 3.1.10 Important diseases of domesticated animals caused by bacteria, viruses, rickettsia, chlamedia and fungi

3.2 Veterinary Parasitology

- 3.2.1 Parasites and Parasitism, Types of parasitism, host-parasite relationship
- 3.2.2 Importance of immunity against parasitic diseases
- 3.2.3 Classification and nomenclature of parasites and characteristics of different classes of parasites

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- 3.2.4 Parasite development in the host system
- 3.2.5 Antiparasitic and anthelmintic medication, their use and abuse. Anthelmintic resistance
- 3.2.6 General description, classification, morphological characteristics and diseases caused by helminths, arthropods, insects and arachnida of domesticated animals and birds and their epidemiology, effects and methods of controlling them
- 3.2.7 Protozoon parasites of domesticated animals and birds, their classification, morphology and the diseases caused by them with epidemiology, effects and control strategies
- 3.2.8 Identification of different parasites and the methods of their culture and laboratory growth

3.3 Veterinary Pathology

- 3.3.1 Pathological responses of body to infection
- 3.3.2 Inflammation, classification and changes in inflammatory responses
- 3.3.3 Pathological disturbances and responses in circulatory system, cell metabolism, pigment metabolism
- 3.3.4 Disturbances in growth, Neoplasm and cancer
- 3.3.5 Healing, fever
- 3.3.6 Uroliths, choleliths, sialoliths, pancreoliths, enteroliths
- 3.3.7 Immune reactions. Hypersensitivity and auto immunity
- 3.3.8 Pathology of diseases of cardiovascular system, hemopoietic system, respiratory system, digestive system, urinary system, genital system, nervous system, endocrine system, sense organs and musculoskeletal system of domesticated animals and birds
- 3.3.9 Pathological changes in diseases caused by bacteria, viruses, fungus and parasites of domesticated animals and birds

3.4 Veterinary Pharmacology and Toxicology

- 3.4.1 Principles of drug activity, pharmacokinetics and pharmacodynamics of the drugs acting on central nervous system
- 3.4.2 Anesthetics, hypnotics, sedatives, tranquilizers, analgesics, analeptics, antipyretics, histamines and antihistamines
- 3.4.3 Anaesthetics, Neuromuscular blocking agents, Peripheral and Central muscle relaxants
- 3.4.4 Drugs acting on autonomic nervous system, neurohumoral transmission, adrenergic antagonists, cholinergic antagonists
- 3.4.5 Drugs acting on cardiovascular system, digestive system, respiratory system, urogenital system and skin and mucus membrane
- 3.4.6 Endocrine pharmacology
- 3.4.7 Vitamins
- 3.4.8 Antibacterial agents, antibiotics, antifungal agents, anthelmintics, antiprotozoal agents, antiviral and anticancer agents
- 3.4.9 Cytotoxic and immunosuppressive drugs
- 3.4.10 Hormones, prostaglandins, corticosteroids
- 3.4.11 Toxicity caused by metals and non metals, plants, commonly used drugs, agrochemicals, venomous bites and stings and environmental toxicity

4. Pre-clinical subjects

16%

4.1 Veterinary Anatomy

- 4.1.1 Gross anatomy of skeletal system, muscular system, nervous system, digestive system, urogenital system, circulatory system, respiratory system,

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reproductive system, glandular system and sense organs of domesticated animals and poultry

4.1.2 Introduction to cell structure, cell division and basic tissue of body. Histology of the organs of musculoskeletal, digestive, respiratory, urinary, reproductive, nervous, cardiovascular, endocrine, lymphoid, sense organs of domesticated animals and birds

4.1.3 General embryology, gametogenesis, fertilization, and development of fetus and body organs in domesticated animals and birds

4.2 Veterinary Physiology

4.2.1 General function and mechanism of action of various organs of circulatory, digestive, respiratory, urinary, reproductive, nervous, sensory system, endocrine system of domesticated animals and birds

4.2.2 Composition and function of tissue fluids

4.2.3 Mechanism of respiration and gaseous exchange

4.3 Biochemistry

4.3.1 Biochemistry of respiration, renal function and acid base balance

4.3.2 Biochemistry of digestion and metabolism of carbohydrate, fat, protein, nucleic acid, minerals and trace elements

4.3.3 Basal and energy metabolism

4.3.4 Biochemistry of hormones and enzymes

4.3.4 Diagnostic biochemistry

4.3.5 Immunochemistry

4.3.6 Biochemistry of cellular and sub cellular components

4.3.7 Biochemistry of carbohydrate, lipids, proteins

4.3.8 Diagnostic biochemistry

4.4 Animal Nutrition

4.4.1 Animal feed classification, nutritional requirements, feeding system and feeding standards of farm animals and birds

4.4.2 Functions of various nutrients and process of digestion in ruminants, non ruminants and birds

4.4.3 Ration formulation for farm livestock and birds

4.5 Livestock Production and Management

4.5.1 Care and management of farm livestock and poultry during different production and growth stages

4.5.2 Housing system for animals and birds

4.5.3 Characteristics of different breeds of farm livestock and birds

4.5.4 System of breeding and selection in farm livestock and poultry birds

4.5.5 Dairy and poultry production

5. Regulatory functions

14%

5.1 Out line of the World Trade Organization (WTOs), Sanitary and Phytosanitary (SPS) measures

5.2 Technical Barrier to Trade (TBT) Trade related aspects of Intellectual Property Rights (IPRs) agreement

5.3 Introduction to OIE, its objectives, function, structure, Standard setting procedures and different standards as set in Terrestrial Animal health code, Aquatic animal health code

5.4 Different standards for Biological preparation and standard Diagnostics Tests for various diseases of farm animals

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- 5.5 Role of Official Veterinary Services in International Trade of animals, products of animal origin, food safety, import risk analysis, import permit
- 5.6 International Veterinary certifications, quarantine inspections and procedures

5.7 Animal Health Related Acts & Regulations

- 5.7.1 Animal Health and Livestock Service Act and Regulation
 - 5.7.2 Slaughterhouse and Meat inspection Act and Regulation
 - 5.7.3 Nepal Veterinary Council Act, 2055 and Regulation, 2057
 - 5.7.4 Feed Act and Regulation
 - 5.7.5 Drug Act, 2035
 - 5.7.6 National Park and Wildlife Conservation Act
 - 5.7.7 Nepal Standard (Certification Mark) Act
 - 5.8 Legal Duties of a Veterinarian, Examinations of animals for soundness, injuries, and sudden death.
 - 5.9 Animal welfare
 - 5.10 Detection of Frauds, Malicious poisoning
 - 5.11 Differentiation of different species of blood, serum, semen, hair, hide and bones
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