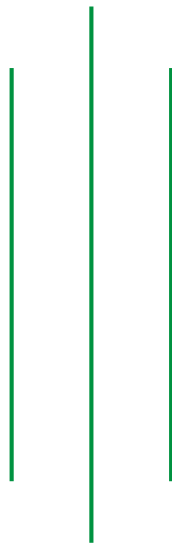


# **Syllabus for Licensing Examination of B.Sc. Anaesthesia Technology 2021**



**Nepal Health Professional Council**

Bansbari, Kathmandu

## Table of Contant

S.No.	Subject	Marks
1.	Human Anatomy and physiology	10%
2.	Biochemistry, Haematology , Blood –Banking and Microbiology	15%
3.	Clinical pathology	5%
4.	Applied Pharmacology	10%
5.	Anaesthesia Technology ( Clinical /Applied/Advance)	60%
	<b>Total</b>	<b>100%</b>

# 1. ANATOMY & PHYSIOLOGY

## Introduction

Cell physiology, Tissue, blood, connective tissue, Bone, joints, Muscular system, Blood cells and its type., Haemoglobin, Jaundice, Anaemia, ESR, PCV, osmotic fragility & blood indices , Homeostasis, Blood Grouping system

## Systems

Cardiovascular system, Gastrointestinal System, Respiratory System, Urinary System, Reproductive system, Endocrine gland , Nervous system, Sensory Organ, Embryology

# 2. BIOCHEMISTRY, HAEMATOLOGY & BLOOD –BANKING AND MICROBIOLOGY

## • Biochemistry

Definition, structure, function, Classification and Metabolism of Carbohydrate, lipid and protein. Digestion and absorption of carbohydrates, proteins and lipids, Nucleotide and Nucleic acid, Enzymes, Vitamins and mineral (Source, RDA, function and disorder of deficiency and excess)

Nutrition: Balanced diet (Definition), Caloric value ; Definition ,RDA, BMR, Caloric values of carbohydrates, proteins and fats, Thermic effect/ SDA of food (Definition, values for major macronutrients), Carbohydrates, Proteins and Fats; Daily dietary requirement. Dietary fibers (Definition, functions, importance and their daily requirements), Malnutrition Radioactive Isotopes

Clinical Biochemistry: Acid, base, pH and pKa, Buffer, Henderson Hasselbalch equation, Acidosis & Alkalosis (Definition, classification, causes and biochemical findings) , Normal serum levels and condition where they are altered in Glucose, Protein, urea, uric acid, creatinine, Bilirubin, Cholesterol and Serum Electrolytes, Renal Function Tests.

## • Haematology

Normal constituents of Blood, their structure and functions, Collection of Blood samples, various anticoagulants used in Haematology, Haemoglobin estimation, different methods and normal values.

Bleeding time. Clotting time, prothrombin time, Activated partial Thromboplastin time

## • Blood Bank

Introduction blood banking, Blood group system, Collection and processing of blood for transfusion, Compatibility testing, Blood transfusion reactions General Pathology Cell injury, inflammation, hemodynamic disorder, immune system, Neoplasia:

## • Microbiology

1. Introduction of Microbiology.
2. Growth and Nutrition of Bacteria, culture media and methods
3. Sterilization
4. Biomedical waste management

5. Principle and practice of Immunology and Infection

6. Systematic bacteriology

Disease caused and laboratory diagnosis of medically important bacteria (Staphylococcus, coagulase negative Staphylococcus, MRSA, Streptococcus pyogenes, Pneumococcus, gonococcus, E.coli, diarrhoeagenic E.coli, Salmonella, Vibrio cholerae, ElTor vibrios, Halophilic vibrios, Shigella, Mycobacterium tuberculosis, Mycobacterium leprae, Atypical

Mycobacteria, Treponema pallidum, leptospira)

7. Introduction to Parasitology

8. Introduction to virology

9. Introduction to Mycology

### 3. CLINICAL PATHOLOGY

#### Introduction to clinical pathology

Collection, transport, preservation and processing of various clinical specimens

Urine examination, Examination of Body fluids; Cerebrospinal fluid (CSF), Sputum and feces.

#### • Applied Pathology:

##### I. Cardiovascular System

- Definition, risk factors, briefly Pathogenesis & morphology, clinical significance and prevention of Atherosclerosis, Hypertension, Aneurysms, Ischaemic Heart disease, valvular Heart Diseases, cardiomyopathy.
- Pericardial effusion- causes, effects and diagnosis.
- Congenital heart diseases - Basic defect and effects of important types of congenital heart diseases.

##### ii. Haematology

- Anaemia - Definition, morphological types and diagnosis of anaemia. Brief concept about Haemolytic anaemia and polycythaemia.
- Leukocyte disorders- Briefly leukaemia, leukocytosis, agranulocytosis etc.,
- Bleeding disorders- Definition, classification, causes & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders.

##### iii. Respiratory System

- Chronic obstructive airway diseases - Definition and types. Briefly causes, Pathology and complications of each type of COPD.
- Briefly concept about obstructive versus restrictive pulmonary disease.
- Pneumoconiosis- Definition, types, Pathology and effects in brief.
- Pulmonary congestion and edema.
- Pleural effusion - causes, effects and diagnosis.

##### iv. Renal System

- Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory

diagnosis of ARF & CRS. Briefly Glomerulonephritis and Pyelonephritis.

- End stage renal disease - Definition, causes, effects and role of dialysis and renal transplantation in its management.
- Brief concept about obstructive uropathy.

## 4. APPLIED PHARMACOLOGY

- General concepts about pharmacodynamic and Pharmacokinetic Principles involved in drug activity.

### I. Autonomic nerves system.

- Anatomy & functional organisation.
- List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.

### II. Cardiovascular drugs- Enumerate the mode of action, side effects and therapeutic uses of the following drugs.

#### a. Antihypertensives

- Beta Adrenergic antagonists
- Alpha Adrenergic antagonists
- Peripheral Vasodilators
- Calcium channel blockers

#### b. Antiarrhythmic drugs

#### c. Cardiac glycosides

#### d. Sympathetic and non-sympathetic inotropic agents.

#### e. Coronary vasodilators.

#### f. Anti-anginal and anti-failure agents

#### g. Lipid lowering & anti atherosclerotic drugs.

#### h. Drugs used in Haemostasis - anticoagulants Thrombolytics and antithrombolytics.

#### i. Cardioplegic drugs- History, Principles and types of cardioplegia.

#### j. Primary solutions - History, principles & types.

#### k. Drugs used in the treatment of shock.

### III. Anaesthetic agents.

### IV. Analgesics

### V. Antihistamines and antiemetics-

### VI. CNS stimulants and depressants

### VII. Pharmacological protection of organs during CPB

### VIII. Inhalational gases and emergency drugs.

### IX. Pharmacotherapy of respiratory disorders

### X. Corticosteroids - Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.

### XI. Diuretics

### XII. Chemotherapy of infections

### XIII. Miscellaneous: IV fluids- various preparations and their usage., Electrolyte supplements, Immunosuppressive agents, New drugs included in perfusion technology, Drugs used in metabolic and electrolyte imbalance.

## 5. ANAESTHESIA TECHNOLOGY

### ANAESTHESIA TECHNOLOGY – CLINICAL

- **Medicine Relevant To Anaesthesia Technology**

Diabetes Mellitus ,Hypertension , Ischaemic heart disease, Obesity, Elderly patient, Pregnancy, Shock, COPD, Chronic renal failure, Chronic liver disease/failure, Anaemia, Pediatric patient infant / neonate, Epilepsy, CVA

- **Introduction To Anaesthesia Technology**

Gas physics, Medical Gas Supply, Gas Administration Devices, Oxygen Therapy ,Anaesthesia Machine, Breathing System, Gas Analysers, Pulse Oximeter, CO<sub>2</sub> Monitor, Manual Resuscitators, Artificial air ways (Oral and Nasal endotracheal tubes, tracheostomy tubes), Methods of cleaning and sterilization of anesthetic equipments, History of Anesthesia, Minimum Standards for anaesthesia

- **Clinical**

1. Pre-operative preparation
2. Informed consent
3. Premedication: Aims: Narcotics, Antihistamines, Antacids and Others-NTG
4. Investigations: Blood, glucose, Urea, Creatinine, Haemogram, Prothrombin Time, Partial thromboplastin time, BT, CT, Urine- Complete urine analysis, ECG, Chest X-ray and ABG
5. Criteria used for accepting the case for surgery.
6. Equipment Checking the machine, laryngoscopes, tubes, airways etc. suction apparatus, oxygen Cylinder, anaesthetic drugs and emergency drugs.
7. Monitoring system
8. Induction - Anaesthesia  
Endotracheal intubation, confirming the tube position and securing the tube Maintenance of anaesthesia, Fluid / Blood and electrolyte balance, Reversal from anaesthesia - drugs used
9. Preparations Identification, Consent, NPO, Prosthesis, Lab results, Consultation, Blood
10. Testing Machine: Gas supply, Flow meters, O<sub>2</sub> bypass, Valves, Vaporises
11. Emergency Drugs Atropine, Epinephrine, Isoprenaline, Ephedrine, Aminophylline, Hydrocortizone, Soda Bicarb, Dopamine, Norepinephrine, Dobutamine
12. I. V. Infusion: Site of cannulations, finding a vein, Technique of venupuncture, Special difficulty
13. Protection of the Patient  
Eyes, ears, skin, lips, tongue, teeth, Veins, arteries and Peripheral nerves
14. Intubation  
Choice of ETT and Laryngoscope, techniques, complication difficult intubation
15. Emergence, Termination and Recovery
  1. Reversal, oropharyngeal toilet, ET suction, Deflation, Removal of the tube, Transfer of patient
  2. In the recovery room: Patient identification, Diagnosis & Surgery, Type of anesthesia used, Fluid balance and B P
  3. Any complications, Instructions about ventilation, vital sings
  4. Problems in RR: B.P. hypo, hypertension, HR- Tachy, bradycardia, Pallor, cyanosis, dyspnea, Restlessness, Neurological- Seizures, Sweating

- **ANAESTHESIA TECHNOLOGY - APPLIED**

History of anaesthesia in detail Methods of anaesthesia, Inhalational Anaesthesia, Minimum alveolar anaesthetic concentration, Stages of ether anaesthesia, Halothane, Isoflurane, Sevoflurane, Nitrous oxide Narcotic drugs, Opioids analgesics, Morphine Pethidine, Fentanyl, Buprenorphine, Tramadol Difficult intubation, Muscle relaxants, Neuromuscular blockers, Suxamethorium, Pancuronium, Vecuronium, Atracurium, Rocuronium Reversal agents, Intravenous anaesthetic agents, Thiopentone, Propofol, Ketamine, Intraoperative management

Confirm the identity of the patient Transferring the patient Recovery room - setup, things needed expected problems Post operative complications and management, CPR, Monitoring during anaesthesia and surgery, Regional anaesthesia, Spinal Anaesthesia, Epidural Anaesthesia, Nerve blocks, Benzodiazapines, Phenothazines, Neuromuscular transmission, Nerve stimulators Reversal of neuromuscular blockage , Drugs acting on sympathetic nervous system , Local anaesthetic agents Complications and accidents during anaesthesia, Complications: I. Related to equipment, II. Related to airway, III. Cardiovascular System

- **ANAESTHESIA TECHNOLOGY - ADVANCED**

Anaesthesia & co- existing diseases, Ischaemic heart disease, Hypertension, Congestive cardiac failure Arrhythmia & heart blocks, Chronic bronchitis & COPD, Bronchial asthma, Paediatric anaesthesia Liver disease and anaesthesia, Renal disease and anaesthesia, Obesity and anaesthesia, Diabetes mellitus and anaesthesia Thyroid disease and anaesthesia

Obstetric Anaesthesia: Epidural analgesia Anaesthesia for LSCS, Special situations: pre –eclampsia, Anaesthesia for common surgical disorders Anaesthesia for special situations, Shock, low cardiac output & cardiac arrest, Pulmonary function tests & their significance Ventilators - types & methods of ventilation, Humidification, Aerosal therapy, Resuscitation of the Newborn, Anaesthesia for Thoracic Surgery, Anaesthesia for cardiac surgery.