

**Shahid Gangalal National Heart Centre  
Bansbari, Kathmandu**

**Syllabus for Registrar, Cardiac Anesthesiology**

Full Marks: 100

Pass marks: 40

Time: 2 Hours

Objective Questions: 25 x 2 = 50

Short Questions: 3 x 10 = 30

Long Question: 1 x 20 = 20

1. Basics of Cardiac Anesthesia – 20 marks
  - a. History of cardiac anesthesia in SGNHC, Nepal and abroad.
  - b. Physics:
    - i. Anesthesia machines and circuits
    - ii. Physics of pressure measurement
    - iii. Manometers and strain gauzes
    - iv. Physics of laminar and turbulent flow, Viscosity, density.
    - v. Respirometers and Rotameters
    - vi. Physics of gas laws
    - vii. Physics of flow of liquid through tubes, Bernoulli's principle
  - c. Pharmacology
    - i. Pharmacokinetics & Pharmacodynamics of anesthetic drugs used in cardiac anesthesia & surgery.
    - ii. Pharmacology of premedicants in cardiac patients
    - iii. Pharmacology of IV anesthetic agents in cardiac anesthesia
    - iv. Inhalation anesthetic agents used in cardiac anesthesia
    - v. Pharmacology of analgesics (opioids & non-opioids) drugs used for pain management
    - vi. Neuromuscular blocking agents, their pharmacology, abnormal responses; reversal agents
    - vii. Pharmacology of LA drugs related to cardiac surgery
    - viii. Drugs influencing autonomic nervous system
    - ix. Drugs used in control of BP
    - x. Inotropic and Vasoactive support management & choice of agents
  - d. Anatomy & Physiology
    - i. Anatomy, Physiology & Embryology of Heart
    - ii. Brief anatomy & physiology of lungs
    - iii. Heart & lung interactions
    - iv. Physiological changes in the hypothermic patients
    - v. Blood gas analysis acid base balance
    - vi. Clinical trials, use and misuse of statistics
2. Clinical practice of cardiac anesthesia – 30 marks
  - a. Oxygen therapy of toxicity. Oxygen therapy in different cardiac lesions (PAH, HLHS, cyanotic, acyanotic & PDA dependent circulation)
  - b. Pre-op evaluation & optimization of patients scheduled for cardiac surgery, planning for cardiovascular anesthesia and surgery

- c. Cardio Pulmonary Resuscitation
  - d. Balanced & TIVA in cardiac anesthesia and surgery
  - e. Monitoring of a patient scheduled for cardiac procedures: ECG, pulse oxymetry, NIBP, IBP, CVP, PA & Cardiac output, capnography, blood gas
  - f. Blood transfusion, massive transfusion and its complications. Blood products with their respective utilization in different cardiac surgical procedures; Blood conservative technique in cardiac surgery
  - g. CPB, pathophysiology, its conduct, inflammatory response, endocrine response, steroids and other different drugs used in CPB. Temperature management and blood gas strategies (Alpha stat & P<sup>H</sup> stat strategies)
  - h. Peri-operative nutritional support in cardiac surgery
  - i. Vasoplegia and shock; its types; cardiogenic and septic shock and management strategies
  - j. Acute and chronic pain control in cardiac surgical patients
  - k. Cardiac and vascular ultrasound in cardiac surgery and its uses
  - l. Cerebral blood flow and factors affecting brain and spinal cord protection in cardiovascular surgery; deep hypothermic circulatory arrest (DHCA) and its physiological consequences
3. Subspeciality cardiac anesthesia – 30 marks
- a. Adult cardiovascular anesthesia
    - i. Adult congenital surgery and anesthesia
    - ii. Valvular surgery and anesthesia
    - iii. Surgery or IHD and anesthetic management
    - iv. Other adult surgical procedures and anesthesia
  - b. Congenital heart lesions and anesthesia for corrective and palliative surgeries
  - c. Geriatric anesthesia and cardiac surgical patients
  - d. Anesthesia for vascular surgery and carotid surgeries
  - e. Anesthesia for thoracic surgery
  - f. Anesthesia outside the OT – cardiac cath lab suite
  - g. Emergency cardiac surgery in pregnant patients
  - h. Anesthesia for emergency cardiovascular surgical procedures; great vessel injuries
  - i. Recent advances in cardiac anesthesia and surgery
4. Post-op management of cardiac patients – 20 marks
- i. Cardiac Tamponade
  - ii. Arrhythmias
  - iii. Electrolyte disorders
  - iv. Low Cardiac Output states and its management
  - v. Anesthetic consideration in re-exploratory cardiac procedures.
  - vi. IABP; its management and indications.
  - vii. ECMO and its principles
  - viii. Cerebral embolism of air or microclots.
  - ix. Renal failure & cardiac surgery; clinical considerations and management strategies.
  - x. Postoperative hypothermia and its consequences.