

MANIPAL UNIVERSITY

MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2012 SUBJECT: PAPER I: BASIC SCIENCES AS APPLIED TO ANAESTHESIOLOGY

Monday, April 02, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ **Write brief answers (avoiding unnecessary padding).**
✍ **Draw diagrams where appropriate.**

1. Depict how the cardiac action potential of a pacemaker cell differs from that of the quiescent Purkinje fibre. Briefly discuss the ionic basis for automaticity of the pacemaker cell.
(5+5 = 10 marks)
2. What do you understand by the term *total respiratory system resistance*? Mention its value in a healthy adult male and the components that contribute to it. Briefly explain one of the techniques of its measurement.
(2+2+6 = 10 marks)
3. Define the terms osmolarity and osmolality. Discuss briefly the mechanism of action, clinical usage and adverse effects of hypertonic solutions.
(1+1+2+3+3 = 10 marks)
4. Discuss the physiologic role of renin-angiotensin-aldosterone axis in the maintenance of internal homeostasis. Explain the relevance of this axis in anaesthesia.
(7+3 = 10 marks)
5. Compare mivacurium and rocuronium with respect to onset of action, ED₉₅, cost, metabolism and elimination.
(5+5 = 10 marks)
6. Explain the terms *concentration effect*, *second gas effect* and *diffusion hypoxia*. Discuss briefly the effect of changes in cardiac output on the ratio of alveolar anaesthetic concentration to inspired concentration.
(3+3+1+3 = 10 marks)
7. Define (or explain) the terms saturated vapour pressure, specific heat and thermal conductivity. With the help of a diagram, explain the basic principle of construction of an accurate, variable-bypass vaporiser.
(1+1+1+7 = 10 marks)
8. State Avogadro's, Boyle's, Charles' and Guy-Lussac's laws and give examples for their medical application.
(2½×4 = 10 marks)
9. Enumerate the techniques of subclavian vein cannulation. Describe any one technique in detail. Enumerate the complications associated with it.
(2+5+3 = 10 marks)
10. Enumerate various approaches for blocking the sciatic nerve. Describe any one technique in detail.
(3+7 = 10 marks)



MANIPAL UNIVERSITY

MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2012

SUBJECT: PAPER II: CLINICAL ANAESTHESIOLOGY I

Tuesday, April 03, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ Write brief answers (avoiding unnecessary padding).
✍ Draw diagrams where appropriate.

1. Describe the effects of pregnancy on gastrointestinal function. Discuss the pathophysiology and clinical features of Mendelson syndrome. What are the measures recommended to decrease the risk of aspiration in a parturient posted for caesarean section?
(2+4+4 = 10 marks)
2. Discuss the perioperative anaesthetic management of a patient posted for laparoscopy-assisted vaginal hysterectomy. Write a note on the options of postoperative pain management.
(6+4 = 10 marks)
3. Describe in detail the suggested techniques for lumbar epidural anaesthesia for labour and vaginal delivery. Enumerate the complications and write briefly about their management.
(6+4 = 10 marks)
4. Mention the differences between high spinal and total spinal block. How do you treat these conditions? What is the rationale for the administration of oxygen after giving spinal?
(4+4+2 = 10 marks)
5. What are the approaches of performing brachial plexus block? Describe the technique and complications of interscalene approach.
(2+5+3 = 10 marks)
6. Write a note on the pharmacokinetics, pharmacodynamics and toxicity of bupivacaine and ropivacaine. How would you treat bupivacaine toxicity?
(2+2+2+4 = 10 marks)
7. Briefly describe the mechanism of action of epidural opioids. Enumerate the opioids used in the epidural space. What are the side effects of epidural opioids and how do you prevent them?
(3+2+5 = 10 marks)
8. Classify oral hypoglycaemic agents. Describe the perioperative management of a patient with diabetic ketoacidosis posted for emergency laparotomy.
(3+7 = 10 marks)
9. What do you understand by the term “Standard Precautions”? How do you prevent nosocomial transmission of the human immunodeficiency virus (HIV)? Describe the protocol for *post-exposure prophylaxis*.
(4+4+2 = 10 marks)
10. A 40-year old known hypertensive, being evaluated for hoarseness of voice and diagnosed to have vocal cord nodules, is posted for laser excision. Discuss the preoperative considerations and perioperative management of this patient. Write a note on apnoeic oxygenation.
(4+4+2 = 10 marks)



MANIPAL UNIVERSITY**MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2012****SUBJECT: PAPER III: CLINICAL ANAESTHESIOLOGY II**

Wednesday, April 04, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ **Answer ALL questions.**
- ✍ **Write brief answers (avoiding unnecessary padding).**
- ✍ **Draw diagrams where appropriate.**

1. A 55-year-old male patient with descending thoracic aortic aneurysm with good ventricular function is posted for repair. Discuss:
 - i) Intraoperative monitoring
 - ii) Intraoperative problems related to aortic cross clamping and its management

(3+7= 10 marks)
2. A 50-year-old patient is scheduled for an off pump coronary artery bypass grafting. Outline your role in maintaining haemodynamic stability during the process of grafting.

(10 marks)
3. What are the preoperative predictors of postoperative morbidity and mortality in a patient undergoing a right pneumonectomy? What are the recommended precautions you should take with regards to perioperative fluid therapy for this procedure?

(5+5 = 10 marks)
4. Discuss the intraoperative strategies you would plan for control of blood pressure and heart rate during the clipping of a large middle cerebral artery aneurysm under general anaesthesia.

(10 marks)
5. Outline the perioperative complications that can be associated with the technique of hypotensive anaesthesia during major spine surgery.

(10 marks)
6. A 69-year-old man with a large right-sided renal cell carcinoma with evidence of an inferior vena cava thrombus is scheduled for a right nephrectomy. Outline the perioperative problems you anticipate during the procedure and how you would plan to deal with each problem.

(10 marks)

7. Discuss the preoperative evaluation and technique of induction and intubation of a 2-day old term neonate scheduled for repair of eventration of the left hemidiaphragm.
(5+5 = 10 marks)
8. An 8-year-old boy with cerebral palsy weighing 25 kg is scheduled for bilateral femoral osteotomies under general anaesthesia. Outline the anaesthetic concerns for this child and your plan for postoperative analgesia.
(10 marks)
9. Define and explain the term Monitored Anaesthesia Care (MAC). A 28-year-old girl with a history of claustrophobia is scheduled for MRI scan of the spine under MAC. Outline the problems you anticipate and how you would manage the situation.
(4+6 = 10 marks)
10. Define the terms “detonation” and “deflagration”. What are the possible sources of ignition in the operating room? How do you specifically prevent a fire hazard during laser surgery?
(2+2+2+4 = 10 marks)



MANIPAL UNIVERSITY**MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2012****SUBJECT: PAPER IV: REANIMATOLOGY & CRITICAL CARE MEDICINE, MANAGEMENT OF CHRONIC PAIN STATES AND ALLIED DISCIPLINES OF ANAESTHESIOLOGY**

Thursday, April 05, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ Write brief answers (avoiding unnecessary padding).
✍ Draw diagrams where appropriate.

1. Compare and contrast recent guidelines for adult and paediatric basic life support with respect to airway, breathing and circulation.
(10 marks)
2. Describe the steps of resuscitation of a young adult who sustains a cardiac arrest following an electric shock.
(10 marks)
3. A 45-year old male is brought to the Accident and Emergency Department in an altered state of consciousness following a road traffic accident. He has a rapid and thready pulse of 140 per minute and a blood pressure of 60/40 mmHg. Describe the assessment and optimisation of the haemodynamic status of this patient. Add a note on noninvasive cardiac output monitoring.
(8+2 = 10 marks)
4. Discuss the perioperative fluid management plan in a 70-kg adult male posted for Whipple's pancreaticoduodenectomy. Discuss the merits and demerits of crystalloid and colloid solutions for intravenous fluid replacement.
(5+5 = 10 marks)
5. A 65-year old man, operated for peritonitis due to large bowel perforation, has a urine output of less than $0.5 \text{ ml kg}^{-1}\text{h}^{-1}$ in the postoperative period. How will you manage his deteriorating renal function? List the types of renal failure and their underlying pathology. What are the criteria for considering dialysis in the intensive care unit?
(4+4+2 = 10 marks)
6. What criteria help to distinguish between Acute Lung Injury (ALI) and Acute Respiratory Distress Syndrome (ARDS)? Describe briefly the pathophysiology of ARDS. Elucidate strategies used for mechanical ventilation in a patient with ARDS.
(1+4+5 = 10 marks)

7. Describe the approach to a patient with chronic backache. Mention the possible mechanisms of action of epidural steroid injection. Add a note on the complications of epidural steroid injection.

(4+4+2 = 10 marks)

8. Explain the pathophysiology and clinical features of *postherpetic neuralgia*. How do you treat a patient with postherpetic neuralgia?

(2+3+5 = 10 marks)

9. Describe in detail your technique of airway management in a 2-year old child with Pierre-Robin syndrome scheduled to undergo corrective surgery for club foot. Briefly outline your plan for extubation.

(8+2 = 10 marks)

10. Prepare a protocol that aims to study the haemodynamic effects following endotracheal intubation using two different techniques of intubation (direct laryngoscopy *versus* lightwand-aided intubation).

(10 marks)

