

MANIPAL UNIVERSITY

MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2011
SUBJECT: PAPER I: BASIC SCIENCES AS APPLIED TO ANAESTHESIOLOGY

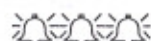
Monday, April 04, 2011

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ Provide brief answers as “padding” your answers will not fetch extra marks.
✍ Draw diagrams where appropriate.

1. Draw the pressure-volume loop of the left ventricle in health and indicate the events of the cardiac cycle on the loop. How does the pressure-volume loop change in a patient with (a) mitral stenosis and (b) aortic regurgitation.
(6+2+2 = 10 marks)
2. Explain the term *dead space* and mention its components. Discuss the factors that influence the anatomical dead space. Briefly explain the measurement of dead space.
(2+3+5 = 10 marks)
3. What are the oxygen-carrying plasma expanders? Mention the current status of these fluids for resuscitation and for perioperative use.
(5+5 = 10 marks)
4. What are the working principles of ultrasound? Discuss briefly the usage of ultrasound in anaesthetic practice and intensive care.
(3+7 = 10 marks)
5. Compare morphine and alfentanil with respect to *pKa*, *plasma protein binding*, *distribution half-life*, *elimination half-life* and *volume of distribution*
(5+5 = 10 marks)
6. Enumerate the properties of an ideal intravenous anaesthetic agent. Mention the indications, absolute contraindications and precautions for the use of thiopentone sodium.
(4+2+2+2 = 10 marks)
7. Classify the newer haemodynamics monitors on the basis of the principle used for measurement of cardiac output. Briefly explain the techniques for cardiac output measurement that are based on pulse contour/pressure analysis.
(3+7 = 10 marks)
8. Define the terms *capnometry* and *capnography*. List two advantages of the mainstream capnometer over the sidestream capnometer. Briefly explain hygroscopic and hydrophobic carbon dioxide measuring devices.
(2+2+3+3 = 10 marks)
9. Describe the technique of performing a 3-in-1 block. Enumerate 3 operations that can be performed using this block.
(7+3 = 10 marks)
10. What is intravenous regional anaesthesia (IVRA)? What precautions do you take during such a technique? Enumerate the indications, contraindications, advantages and disadvantages of IVRA.
(1+2+2+1+2+2 = 10 marks)



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MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2011

SUBJECT: PAPER II: CLINICAL ANAESTHESIOLOGY I

Tuesday, April 05, 2011

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ Answer all questions. Draw diagrams where appropriate.
✍ Write brief answers (avoiding unnecessary padding).
1. What are the factors which affect the transfer of drugs across the placenta? Which vasopressors are currently recommended to maintain optimum maternal and foetal perfusion following hypotension after a central neuroaxial block in a term pregnant patient and why?
(5+5 = 10 marks)
 2. Outline the pathophysiology and clinical presentation of amniotic fluid embolism. How does advanced cardiac life support differ in a term pregnant patient from a non-pregnant patient?
(6+4 = 10 marks)
 3. What are the advantages of sufentanyl over fentanyl as an adjunct for labour analgesia? Outline the problems associated with the administration of opioids during epidural labour analgesia.
(4+6 = 10 marks)
 4. How do neuraxial and regional anaesthesia alter the normal stress response to surgery and anaesthesia?
(10 marks)
 5. Outline a protocol of how you would use a peripheral nerve stimulator while performing a peripheral nerve block. How would you minimise complications related to the use of a nerve stimulator?
(5+5 = 10 marks)
 6. What are the toxic effects of bupivacaine? How can they be prevented? How would you manage a case of bupivacaine toxicity?
(4+2+4 = 10 marks)
 7. Outline the deleterious physiologic effects of postoperative pain. What are the advantages of delivering opioids through a thoracic epidural compared to a lumbar epidural catheter?
(6+4 = 10 marks)
 8. Outline the physiologic effects of insulin. What are the common causes and symptoms of perioperative hypoglycemia?
(4+6 = 10 marks)
 9. Briefly describe how you would proceed with the preoperative evaluation of a patient with a moderate sized thyroid swelling scheduled for elective thyroid surgery?
(10 marks)
 10. Compare and contrast percutaneous dilatational tracheostomy with classic surgical tracheostomy. What problems would you anticipate following a tracheostomy?
(6+4 = 10 marks)



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MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2011

SUBJECT: PAPER III: CLINICAL ANAESTHESIOLOGY II

Wednesday, April 06, 2011

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

- ✍ Provide brief answers as “padding” your answers will not fetch extra marks.
✍ Draw diagrams where appropriate.

1. Outline the perioperative anaesthetic management of a 38-year old woman with severe mitral stenosis in atrial fibrillation scheduled for simple mastectomy. (10 marks)
2. Describe the anaesthetic management of a 3-year old child with recurrent lower respiratory tract infection scheduled for ligation of patent ductus arteriosus. (10 marks)
3. Describe the preoperative evaluation and intraoperative management of a patient with right sided bronchiectasis scheduled for right pneumonectomy. (4+6 = 10 marks)
4. List the monitors available for detection of venous air embolism in decreasing order of sensitivity. Discuss the causes for delayed awakening following craniotomy. (5+5 = 10 marks)
5. Describe the measures you would take for blood conservation during posterior instrumentation and stabilisation for thoracolumbar scoliosis. Briefly discuss the postoperative management following this surgery. (6+4 = 10 marks)
6. Describe your plan for anaesthetic management of transurethral resection of a bladder tumour. Add a note on any differences in anaesthetic concerns from transurethral resection of prostate. (6+4 = 10 marks)
7. Describe the anaesthetic concerns and perioperative management of a 3-day old term neonate scheduled for emergency colostomy for Hirschsprung’s disease. (10 marks)
8. Describe your plan of preoperative evaluation and anaesthetic management of a 12-year old girl suffering from acute appendicitis scheduled to undergo emergency appendicectomy. (10 marks)
9. Describe the signs that would lead one to suspect the development of malignant hyperthermia under general anaesthesia. Present your management plan for such an event. (5+5 = 10 marks)
10. What criteria need to be met before discharging a patient who has undergone day-care surgery? Briefly describe the reasons for necessitating overnight admission. (6+4 = 10 marks)



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MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2011

SUBJECT: PAPER IV: REANIMATOLOGY & CRITICAL CARE MEDICINE, MANAGEMENT OF CHRONIC PAIN STATES AND ALLIED DISCIPLINES OF ANAESTHESIOLOGY

Thursday, April 07, 2011

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Provide brief answers as “padding” your answers will not fetch extra marks.

✍ Draw diagrams where appropriate.

1. Discuss the current status of the endotracheal and intraosseus routes for drug administration during paediatric advanced life support. Describe briefly the technique of securing intraosseous access in a 2-year old child.
(3+3+4 = 10 marks)
2. Describe the pathophysiological effects of drowning (submersion). Outline the steps of resuscitation of a 24-year old male who has just been rescued from a river in a state of unconsciousness.
(4+6 = 10 marks)
3. A 25-year male with history of dyspnoea, hoarseness of voice and cough is brought to the Emergency Room following an assault with a hockey stick. On preliminary examination, there is drooling of saliva, bruising and subcutaneous emphysema in front of the neck. How would you assess and manage this patient.
(10 marks)
4. Discuss the perioperative fluid and electrolyte management strategies in a 70-year old male weighing 50 kilograms who underwent emergency laparotomy for intestinal obstruction of 7-days duration.
(10 marks)
5. Elucidate the causes of ventilator dependence in mechanically ventilated patients. What are the criteria used to predict successful weaning from mechanical ventilation? What are the subjective and objective criteria used to indicate tolerance of a spontaneous breathing trial?
(3+4+3 = 10 marks)
6. A 60-year old smoker, known case of chronic obstructive pulmonary disease, is admitted with an acute exacerbation. His PaO₂ is 70 mmHg and PaCO₂ is 70 mmHg while breathing 60% oxygen through a venturi mask. He is conscious and oriented but tachypnoeic. Describe in detail your management options for ventilatory support in this patient. What is *auto-PEEP* and how will it affect ventilatory management?
(8+2 = 10 marks)
7. Classify drugs used in the management of chronic pain. Add a note on the role of adjuvants in the treatment of chronic pain.
(6+4 = 10 marks)
8. With the help of diagrams, explain the anatomy, technique and complications of *stellate ganglion block*.
(3+4+3 = 10 marks)
9. Discuss the salient modifications of the American Society of Anesthesiologists' Difficult Airway algorithm for management of victims of trauma to the airway.
(10 marks)
10. Describe the different techniques of randomisation. Explain the rationale of randomisation in the conduct of a clinical trial.
(7+3 = 10 marks)

