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## MANIPAL UNIVERSITY

MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2010

SUBJECT: PAPER I: BASIC SCIENCES AS APPLIED TO ANAESTHESIOLOGY

Monday, April 05, 2010

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.

HEALTH SCIENCES LIBRARY

1. Briefly describe the neurotransmitters and receptor groups of the autonomic nervous system that mediate neural control of cardiac function. Enumerate the cardiac reflexes which are of importance to the anaesthesiologist. Describe the phases of the haemodynamic changes produced by the Valsalva manoeuvre.  
(3+4+3 = 10 marks)
2. Describe the factors that are involved in the *Starling's equation*. Using the equation, explain the tendency of interstitial pulmonary edema occurring in zones 3 and 4 of West.  
(5+5 = 10 marks)
3. Define the terms *acidosis* and *alkalosis*. Explain the concept of anion gap. Giving appropriate examples, classify metabolic acidosis based on the anion gap.  
(2+2+3+3 = 10 marks)
4. With the help of a labeled diagram, describe the structure of the human nicotinic acetylcholine receptor. What is *miniature end plate potential*? What features of the human neuromuscular junction ensure efficient and reliable transmission of released acetylcholine into the end plate potential?  
(4+3+3 = 10 marks)
5. What are the factors determining the speed of uptake of an inhalational anaesthetic agent. Compare and contrast halothane and desflurane with respect to their partition coefficients, MAC values and offset of anaesthetic action.  
(4+2+2+2 = 10 marks)
6. With appropriate dose-effect graphs and illustrative examples, explain the terms *agonist*, *partial agonist*, *antagonist* and *inverse agonist*.  
(2+3+2+3 = 10 marks)
7. Explain the terms *fundamental frequency*, *natural frequency* and *damping coefficient*, and explain their importance in faithful reproduction of the arterial pressure waveform. Describe the *fast flush test* with respect to dynamic response of the invasive monitoring system.  
(2+2+2+4 = 10 marks)
8. What are the characteristics that determine the nature of flow of fluids through a tube? What is critical velocity? With regard to laminar flow, explain the term *entrance length*. What are the factors that determine the pressure drop across a tube in which flow is turbulent?  
(3+1+2+4 = 10 marks)
9. Name the intrinsic muscles of the larynx and group them according to their actions. Describe the motor and sensory innervations of the larynx. Describe the course and relations of the superior laryngeal nerve.  
(4+3+3 = 10 marks)
10. Describe the anatomy of the sacral canal and the surface anatomy of the sacrum that is relevant for the performance of caudal epidural anaesthesia.  
(10 marks)



## MANIPAL UNIVERSITY

## MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2010

## SUBJECT: PAPER II: CLINICAL ANAESTHESIOLOGY I

Tuesday, April 06, 2010

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 perioperative concerns and anaesthetic management of a 22-year old lady with retained placenta and postpartum haemorrhage in hypovolaemic shock posted for manual removal of placenta. (10 marks)
2. A 56-year old lady with carcinoma cervix and bilateral hydronephrosis is pale, emaciated and has altered renal function. Describe the preoperative evaluation and anaesthetic management of this patient posted for staging laparotomy. (10 marks)
3. Describe briefly with the help of a neatly labeled diagram the pathways subserving labour pain. Enumerate the techniques used to manage labour pain. Elaborate the role of epidural analgesia in the management of labour pain. (3+7 = 10 marks)
4. Enumerate the methods used to identify the peripheral nerve. Describe the clinical use of a peripheral nerve stimulator for nerve location. Describe the innervation of the foot and the technique of ankle block. (2+2+3+3 = 10 marks)
5. What is postdural puncture headache (PDPH)? Enumerate the factors that increase the incidence of PDPH. How will you diagnose and treat a case of PDPH? (1+2+2+5 = 10 marks)
6. Describe the chemical structure of local anesthetics. Providing suitable examples, describe the classification of local anesthetics based on their chemical structure. (5 + 5 = 10 marks)
7. Discuss the options available for pain relief following inguinal herniotomy in a 2-year old child weighing 12 kilogram. Describe in detail the technique and the role of caudal analgesia in this child. (5+5 = 10 marks)
8. Classify the types of insulin available. Describe the various regimes for perioperative insulin therapy. (3+7 = 10 marks)
9. Outline the principles of perioperative management of a patient posted for excision of the right adrenal gland for suspected phaeochromocytoma. (10 marks)
10. Discuss the preoperative considerations and perioperative anaesthetic management of a 12-year old girl with Down syndrome scheduled for extraction of multiple carious teeth. (4+6 = 10 marks)



## MANIPAL UNIVERSITY

## MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2010

## SUBJECT: PAPER III: CLINICAL ANAESTHESIOLOGY II

Wednesday, April 07, 2010

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. Describe the anaesthetic implications and management of a 43-year old woman with rheumatic mitral stenosis (mitral valve area of  $1 \text{ cm}^2$ ) posted for abdominal hysterectomy for dysfunctional uterine bleeding. (4+6 = 10 marks)
2. A 3-year old boy weighing 12 kg diagnosed to have tetralogy of Fallot is posted for cardiac catheterisation. Briefly describe the preoperative preparation of this patient. Enumerate the anticipated critical events during the procedure and your plan for management of these critical events. (3+3+4 = 10 marks)
3. Describe the preoperative evaluation and preparation of a patient with chronic bronchiectasis scheduled for pneumonectomy. (5+5 = 10 marks)
4. Discuss the preoperative evaluation/preparation and intraoperative management of a patient scheduled to undergo craniotomy for resection of supratentorial meningioma. (4+6 = 10 marks)
5. Discuss the preoperative evaluation and anaesthetic management of a 65-year old lady diagnosed to have rheumatoid arthritis scheduled for total hip arthroplasty. (4+6 = 10 marks)
6. Describe the preoperative evaluation and intraoperative management of a patient with chronic renal failure scheduled for open reduction and internal fixation of fracture shaft of humerus. (5+5 = 10 marks)
7. A 6-day old term neonate weighing 3 kilograms is scheduled for an emergency arthrotomy of the right hip joint for septic arthritis. Enumerate your concerns in the management of this case. Briefly outline your plan for perioperative management emphasising each of your concerns. Mention alternate anaesthetic options that might be considered. (2+7+1 = 10 marks)
8. A 2-year old child is scheduled to undergo laparotomy for intestinal obstruction due to intussusception. Detail your plan of anaesthetic management, with appropriate focus on preoperative assessment and anaesthetic concerns. (3+3+4 = 10 marks)
9. Discuss the methods available for sterilisation of anaesthetic equipment. (10 marks)
10. Discuss the factors that contribute to postoperative cognitive dysfunction in elderly surgical patients and the strategies for minimising the same. (5+5 = 10 marks)



## MANIPAL UNIVERSITY

## MD (ANAESTHESIOLOGY) DEGREE EXAMINATION – APRIL 2010

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

Thursday, April 08, 2010

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions. Use diagrams where appropriate.

✍ Write brief answers (avoiding unnecessary padding).

1. Discuss the current cardiopulmonary resuscitation guidelines for the management of unstable supraventricular tachycardia. (10 marks)
2. Outline the criteria for establishing a diagnosis of brain death. (10 marks)
3. Outline the principles of management of a patient with acute traumatic injury to the cervical spine and in spinal shock. (10 marks)
4. What does the term autologous blood transfusion mean? Enumerate the advantages and disadvantages of this technique. (2+8 = 10 marks)
5. Outline the details of any one scoring system for evaluating a critically ill patient admitted in the intensive care unit. (10 marks)
6. Briefly outline the clinical and laboratory criteria you would consider for the weaning of a patient being mechanically ventilated for respiratory failure. (10 marks)
7. Outline the role and indications for intraspinal pain therapies in patients with cancer pain. (10 marks)
8. Outline the WHO ladder recommended for providing pain relief for chronic cancer pain. Describe in detail, the role of oral morphine in the treatment of cancer pain. (5+5 = 10 marks)
9. Briefly outline the guidelines for management of the airway in a patient who has sustained a road traffic accident and you suspect trauma to the trachea. (10 marks)
10. When planning a prospective clinical trial explain how you would decide on an appropriate sample size. Explain the importance of blinding and randomization. (10 marks)

