Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – JULY 2005

SUBJECT: PAPER I: BASIC SCIENCES AS APPLIED TO ANAESTHESIOLOGY

Monday, July 04, 2005

Time: 3 Hrs. Max. Marks: 100

General Instructions to Candidates:

- Be brief in your answers; padding your answers will not get you any extra credit.
- Illustrate your answer with clearly labeled diagrams where appropriate.

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1. Define mean arterial pressure. Outline the mechanisms that control blood pressure. Describe the role of nitric oxide in the regulation of blood pressure. (2 + 5 + 3 = 10 marks)

2. With the help of a diagram, define the static lung volumes and capacities in a normal 70-kg adult male. (10 marks)

3. Describe the physiological basis of the upper and lower oesophageal sphincter function and how they differ. Name the factors that alter the tone of the lower oesophageal sphincter. (6 + 4 = 10 marks)

4. Outline the factors that affect uptake and clearance of local anaesthetics from the site of injection. (10 marks)

5. Explain the process of Hoffman elimination. Describe the elimination pathway of succinylcholine. (5 + 5 = 10 marks)

6. Describe the physical principle of the pressure transducer used for invasive pressure monitoring. With the help of a diagram, explain the differences between the right atrial and right ventricular pressure tracings. (5 + 5 = 10 marks)

7. Classify Mapleson's circuits. Describe the functional analysis of the Mapleson A circuit. How does it differ from the Bain's circuit? (3 + 4 + 3 = 10 marks)

8. Describe the sensory and motor nerve supply of the larynx. Explain various methods by which the superior laryngeal nerve or its branches can be blocked. (4 + 6 = 10 marks)

9. Describe the signs and symptoms of postdural puncture headache (PDPH)? Outline the aetiology, prevention and treatment of PDPH? (4 + 2 + 2 + 2 = 10 marks)

10. Describe the indications, technique and complications of intravenous regional anesthesia. (2 + 5 + 3 = 10 marks)

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DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – JULY 2005

SUBJECT: PAPER II: CLINICAL ANAESTHESIOLOGY

Tuesday, July 05, 2005

Time: 3 Hrs. Max. Marks: 100

General Instructions to Candidates:

- Be brief in your answers; padding your answers will not get you any extra credit.
- Illustrate your answer with clearly labeled diagrams where appropriate.

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1. Discuss the preoperative evaluation and anaesthetic management of a 5-year old child weighing 15 kg scheduled for cardiac catheterisation for a suspected ventricular septal defect. (10 marks)

2. A 45-year old known asthmatic on treatment with inhaled salbutamol and steroids is scheduled for gastrojejunostomy and vagotomy. Discuss the preoperative evaluation, preparation and anaesthetic management (with special emphasis on management of intraoperative bronchospasm). (2 + 3 + 5 =10 marks)

3. Present your plan for anaesthetic management of a 30-year old man with a cerebellopontine angle tumour scheduled for excision of the tumour in the lateral position. (10 marks)

4. Discuss the anaesthetic management (giving reasons for your choice of monitors) of a 22-year old lady scheduled to undergo laparoscopic excision of an ovarian cyst. (7 + 3 = 10 marks)

5. A 12-hour old neonate born after 37 weeks of gestation and weighing 2200 gm presents with frothing at the nose and mouth and is diagnosed to have a tracheoesophageal fistula. Discuss the perioperative management of this neonate scheduled for corrective repair. (10 marks)

6. A 35-year old carpenter presents to the emergency room after removing a nail that had struck and embedded itself in his right eye. He has had a full meal one-hour prior to the accident. Discuss the preoperative preparation, choice of induction agents / muscle relaxants and anaesthetic management of this patient scheduled for emergency repair of the penetrating eye injury. (3 + 3 + 4 =10 marks)

7. A 24-year old male with chronic renal failure is on maintenance haemodialysis on a twice-weekly basis. Discuss the anaesthetic management of this patient scheduled to receive a kidney from his mother. (10 marks)

8. Discuss the preoperative evaluation, preparation and anaesthetic management of a 70-year old man with uncontrolled diabetes mellitus (random blood sugar of 300 mg% and no ketonuria) scheduled for emergency laparotomy for intestinal obstruction. (2 + 2 + 6 = 10 marks)

9. What is the *failed intubation drill* in obstetric anaesthesia? How will you proceed when intubation has failed and an immediate caesarean section is indicated? (4 + 6 = 10 marks)

10. Enumerate the physiological changes caused by application and release of a lower limb tourniquet. What is the maximum tourniquet pressure and the maximum duration for which tourniquets can be applied over the upper and lower limbs? (6 + 4 = 10 marks)

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MANIPAL ACADEMY OF HIGHER EDUCATION

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DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – JULY 2005

SUBJECT: PAPER III: REANIMATOLOGY, CRITICAL CARE MEDICINE, MANAGEMENT OF PAIN & MISCELLANEOUS ANAESTHESIOLOGY RELATED TOPICS

Wednesday, July 06, 2005

Time: 3 Hrs. Max. Marks: 100

General Instructions to Candidates:

- Be brief in your answers; padding your answers will not get you any extra credit.
- Illustrate your answer with clearly labeled diagrams where appropriate.

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1. Outline the steps of ACLS algorithm for refractory ventricular fibrillation. Write the mechanism of action and the dose of amiodarone in a cardiac arrest situation. (6 + 4 = 10 marks)

2. Enumerate the salient differences in cardiopulmonary resuscitation in the following situations:
   a) Pregnancy
   b) Hypothermia (5 + 5 = 10 marks)

3. Define *massive blood transfusion*. Enumerate the complications of the same. (3 + 7 = 10 marks)

4. A 30-year old lady who has recently had a normal vaginal delivery complains of chest pain and breathing difficulty. Her blood pressure is 100/60mmHg, pulse rate is 98/minute, respiratory rate is 30 breaths per minute and the pulse oximeter shows a saturation of 80% on room air. What is the probable diagnosis? How will you evaluate and manage this patient? (2 + 4 + 4 = 10 marks)

5. What do you understand by the term *refractory hypoxemia*? What are the ventilatory strategies available for acute respiratory distress syndrome. (3 + 7 = 10 marks)

6. A patient with craniofacial trauma has arrived in the emergency room. He is unable to maintain a patent airway and is desaturating. What are the immediate measures you would take to prevent desaturation? Discuss the options for management of the airway in such a patient. (2 + 8 = 10 marks)

7. Trace the pain pathway. Indicate the exact site of action of various pain relief modalities. (5 + 5 = 10 marks)

8. What are the various methods of offering pain relief to a child who is undergoing a circumcision. List out the advantages and disadvantages of each technique. (4 + 6 = 10 marks)

9. A patient is diagnosed to have an inoperable carcinoma of the pancreas. What are the various methods of relieving the severe abdominal pain in this patient? (10 marks)

10. What are the features of *complex regional pain syndromes*? How would you treat a 25-year old man admitted with reflex sympathetic dystrophy of his right hand? (4 + 6 = 10 marks)

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MANIPAL ACADEMY OF HIGHER EDUCATION

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DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – DECEMBER 2005

SUBJECT: PAPER I: BASIC SCIENCES AS APPLIED TO ANAESTHESIOLOGY

Monday, December 05, 2005

Time: 3 Hrs. Max. Marks: 100

- **General Instructions to Candidates:**
  - **Be brief in your answers; padding your answers will not get you any extra credit.**
  - **Illustrate your answer with clearly labeled diagrams where appropriate.**

1. Explain the physiological basis of monitoring of pulmonary capillary wedge pressure as an indicator of left ventricular end-diastolic pressure. With the help of a diagram, indicate the route through which a pulmonary artery catheter has to pass when introduced via the right internal jugular vein. Illustrate the appropriate pressures and waveforms that help you identify the location of the tip of the catheter. (3 + 2 + 5 = 10 marks)

2. What is "venous admixture"? Explain the physiological basis of why different zones of the lung have different ventilation-perfusion ratios. (3 + 7 = 10 marks)

3. Draw a labeled diagram of the nephron. Describe the function of the various parts of the nephron in the maintenance of fluid and electrolyte balance. (4 + 6 = 10 marks)

4. Describe the mechanism of action of benzodiazepines on the central nervous system. How does the effect of these drugs alter when administered along with systemic opioids? (6 + 4 = 10 marks)

5. Describe the actions of nondepolarising relaxants on the motor end plate. (10 marks)

6. Describe the *pin index system* incorporated into anaesthesia machines? Mention the pin indices for oxygen, nitrous oxide and entonox. What are the other features incorporated into the anaesthesia machine that prevent connection of wrong gases to the high-pressure side of the machine? (4 + 2 + 4 = 10 marks)

7. What are the sources of ignition and possible fire hazards in the operating room and give recommendation for prevention of the same. (5 + 5 = 10 marks)

8. With the help of appropriate diagrams, explain the dermatomal distribution of the upper limb. (10 marks)

9. Describe the factors affecting the height of block following a subarachnoid injection of a local anaesthetic. (10 marks)

10. Describe the procedure of performing brachial plexus block by the axillary approach. What are the advantages of this approach over the supraclavicular approach? (8 + 2 = 10 marks)

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DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – DECEMBER 2005

SUBJECT: PAPER II: CLINICAL ANAESTHESIOLOGY

Tuesday, December 06, 2005

Time: 3 Hrs. Max. Marks: 100

General Instructions to Candidates:

- **Be brief in your answers; padding your answers will not get you any extra credit.**
- **Illustrate your answer with clearly labeled diagrams where appropriate.**

1. A 55-year old lady with an infrarenal aortic aneurysms measuring 6 centimetres in length is scheduled for repair of the aneurysm. Discuss the preoperative evaluation, preparation and intraoperative management of this patient. (2 + 2 + 6 = 10 marks)

2. Discuss the anaesthetic management of a 4-year old child weighing 11 kg undergoing emergency bronchoscopic removal of an inhaled foreign body lodged in the right main bronchus. (10 marks)

3. A 40-year old man has an unstable cervical spine for which he wears a cervical collar. Discuss the preoperative evaluation and anaesthetic management of this patient scheduled for stabilisation of the cervical spine by the anterior approach. (3 + 7 = 10 marks)

4. Describe how would you provide anaesthesia for an emergency caesarean section in a parturient who has lost a considerable amount of blood due to placenta praevia and arrives in the operating room with a heart rate of 150 beats per minute and arterial blood pressure 80/50 mmHg. (10 marks)

5. Discuss the preoperative evaluation, anaesthetic management and postoperative care of a 3-year old male child scheduled for right inguinal herniotomy. (2 + 4 + 4 = 10 marks)

6. Discuss the perioperative management of a patient with carcinoma of the larynx scheduled for a total laryngopharyngoesophagectomy with gastric pull-up. (10 marks)

7. Enumerate the measures that you could use to minimise the incidence and severity of the *TURP syndrome*. A 65-year old, 60 kg man with no preexisting disease develops clinical features suggestive of the TURP syndrome (serum sodium 115 mmol/L). Outline the steps of management of this situation. (4 + 6 = 10 marks)

8. A 75-year old man is scheduled for an exploratory laparotomy for a suspected gastric malignancy. Discuss the plan of anaesthetic management with special emphasis on the anaesthetic implications in the geriatric population. (10 marks)

9. Describe the equipment that would constitute an ideal *difficult airway cart*. (10 marks)

10. Discuss in brief the anaesthetic management of 30-year old male with depressive mood disorder scheduled for modified electroconvulsive therapy (MECT). What are the physiological effects of MECT? Enumerate contraindications for MECT. (4 + 4 + 2 = 10 marks)

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DIPLOMA IN ANAESTHESIOLOGY (DA) EXAMINATION – DECEMBER 2005

SUBJECT: PAPER III: REANIMATOLOGY, CRITICAL CARE MEDICINE, MANAGEMENT OF PAIN & MISCELLANEOUS ANAESTHESIOLOGY RELATED TOPICS

Wednesday, December 07, 2005

Time: 3 Hrs. Max. Marks: 100

- **General Instructions to Candidates:**
  - **Be brief in your answers; padding your answers will not get you any extra credit.**
  - **Illustrate your answer with clearly labeled diagrams where appropriate.**

1. What is the current status of vasopressin in the ventricular fibrillation algorithm? What are the proposed benefits of vasopressin over adrenaline. Outline the ventricular fibrillation / pulseless ventricular tachycardia algorithm. (2 + 2 + 6 = 10 marks)
2. What are the different routes used for administering drugs in a child with cardiac arrest? How is cardiopulmonary resuscitation different in a 5-year old child with respect to chest compression, dose of adrenaline, use of AED and defibrillation [2 + (2 X 4) = 10 marks]
3. A 17-year old girl comes to the emergency room with palpitations and gives a history of such episodes in the past. Presently her pulse rate is 160 beats per min. What is the probable diagnosis? How would you plan your management in such a case? (3 + 7 = 10 marks)
4. A 32-year old male comes with a fracture of the right femur to the trauma centre. He complains of difficulty in breathing. On examination, he has a respiratory rate of 46 per minute and petechial haemorrhages over the upper part of the trunk. What is the probable diagnosis? How would you investigate and manage the patient? (2 + 3 + 5 = 10 marks)
5. What are the predisposing factors for ventilator associated pneumonia. Formulate a protocol for prevention of ventilator associated pneumonia in an intensive care unit. (4 + 6 = 10 marks)
6. What are the signs and symptoms of organophosphorus poisoning? How would you manage an unconscious patient who has consumed the compound 2 hours prior to admission and presents with shallow breathing? (4 + 6 = 10 marks)
7. Classify opioid receptors? What is the proposed mechanism of action of neuroaxial opioids? (4 + 6 = 10 marks)
8. What are the postoperative pain relief options for a 2-year old child who has undergone a cleft lip repair? (10 marks)
9. A young adult is refered to the pain clinic with excruciating pain in the distal part of the right arm and hand. He is diagnosed to have postherpetic neuralgia. What are the available methods of pain relief for such a patient? (10 marks)
10. A 50-year old lady with carcinoma of the cervix has undergone a Wertheim's hysterectomy and received chemotherapy. She now complains of severe pain in the perineum. How are you planning to give pain relief for such a patient. (10 marks)