INI CET Anaesthesiology

Sample Paper – 3

Duration: 14 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Anaesthesiology content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Anaesthesiology items you actually meet in the real 200-question paper.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **14 minutes**, the pace the real computer-based test demands.

Preoperative Assessment and Airway

Q1. Which of the following bedside findings is recognised as an independent predictor of **difficult mask ventilation**?

(A) A full beard in an obese, edentulous, elderly patient who snores

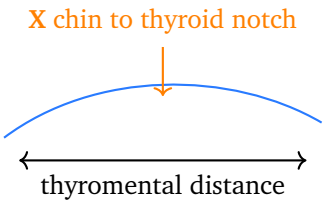
(B) A young, slim, clean-shaven patient with a full set of teeth

(C) A normal thyromental distance of 7 cm

(D) A Mallampati class I view

Q2. The airway measurement illustrated below, taken from the thyroid notch to the mentum (chin) with the neck fully extended, is the **thyromental**

distance. A value *less than* the marked threshold predicts a difficult laryngoscopy. That threshold is:



(A) Less than 12 cm

(B) Less than 10 cm

(C) Less than 6 cm (about three ordinary finger-breadths)

(D) Less than 2 cm

Q3. A cooperative adult with a large, fixed anterior neck mass and a known **anticipated difficult airway** is scheduled for surgery. The safest technique to secure the airway is:

(A) Rapid sequence induction with suxamethonium and immediate direct laryngoscopy

(B) Deep inhalational induction followed by an attempt at blind nasal intubation

(C) A standard intravenous induction with rocuronium, then laryngoscopy

(D) Awake fibreoptic intubation with the patient breathing spontaneously

General Anaesthesia and Pharmacology

Q4. The intravenous induction agent that is notably **cardiostable** and therefore favoured in shocked or cardiac-compromised patients, but which causes myoclonus on induction and suppresses adrenal steroid synthesis, is:

(A) Propofol

(B) Ketamine

(C) Thiopental sodium

(D) Etomidate

Q5. A non-depolarising neuromuscular blocker whose elimination is **organ-independent**, occurring by spontaneous Hofmann degradation in plasma, making it particularly useful in patients with combined renal and hepatic failure, is:

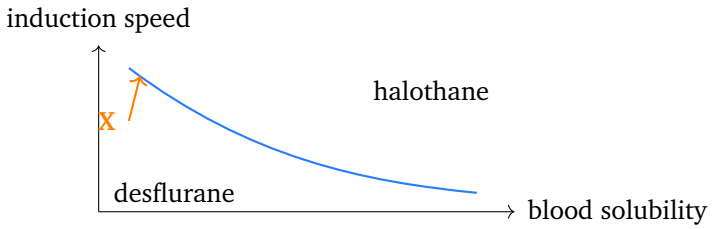
(A) Vecuronium

(B) Pancuronium

(C) Atracurium

(D) Suxamethonium

Q6. The schematic below relates the **blood-gas partition coefficient** of a volatile agent to the speed of induction. An agent with a *low* blood-gas coefficient (marked **X**) gives:



(A) A rapid induction and rapid recovery (for example desflurane)

(B) A slow induction and slow recovery

(C) No effect on the speed of induction

(D) A guaranteed cardiac arrest

Regional and Local Anaesthesia

Q7. Local anaesthetics produce conduction block by acting on a specific ion channel in the nerve membrane. The primary molecular target is:

(A) The voltage-gated sodium channel, blocked from the intracellular side

(B) The voltage-gated potassium channel

(C) The nicotinic acetylcholine receptor

(D) The sodium-potassium ATPase pump

Q8. Comparing single-shot **spinal** anaesthesia with **epidural** anaesthesia, which single statement is correct?

(A) Spinal anaesthesia has a slow, gradual onset while epidural is almost immediate

(B) Spinal anaesthesia uses a small drug dose into the cerebrospinal fluid with rapid onset, whereas epidural uses a larger dose in the epidural space with slower onset and allows catheter top-ups

(C) Epidural anaesthesia always uses a smaller drug dose than spinal

(D) A catheter for continuous top-ups can only be placed in the subarachnoid (spinal) space

Monitoring, Fluids and Equipment

Q9. On a continuous-flow anaesthesia machine, the **oxygen failure (fail-safe) device** is designed to:

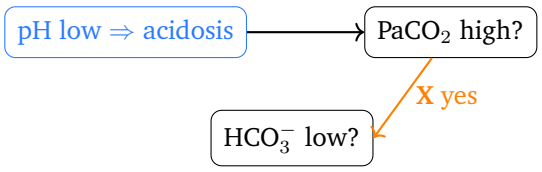
(A) Increase the delivered nitrous oxide when oxygen runs low

(B) Warm the inspired gases to body temperature

(C) Measure the patient's end-tidal carbon dioxide

(D) Sound an alarm and cut off or reduce nitrous oxide delivery if the oxygen supply pressure falls, preventing a hypoxic mixture

Q10. An intubated, hypoventilating patient has an arterial blood gas of pH 7.24, $PaCO_2$ 62 mmHg and bicarbonate 24 mmol/L. Using the decision path below, the disturbance is:



(A) A metabolic acidosis

(B) A respiratory acidosis

(C) A metabolic alkalosis

(D) A respiratory alkalosis

Q11. Using the **4-2-1 rule**, the hourly maintenance intravenous fluid requirement for a child weighing **22 kg** is:

(A) 22 mL per hour

(B) 62 mL per hour

(C) 220 mL per hour

(D) 88 mL per hour

Complications and Critical Incidents

Q12. A patient develops sudden hypotension, bronchospasm and a widespread rash shortly after a drug is given at induction. The commonest triggering drug class for perioperative **anaphylaxis**, and the first-line drug for treatment, are:

(A) Volatile agents; treated first with intravenous hydrocortisone

(B) Local anaesthetics; treated first with an antihistamine

(C) Neuromuscular blocking agents; treated first with intramuscular or intravenous adrenaline

(D) Crystalloid fluids; treated first with atropine

Q13. A non-fasted patient regurgitates and inhales acidic gastric contents at induction, then develops hypoxia, wheeze and bilateral infiltrates. This chemical pneumonitis from acid aspiration is known as:

(A) Ludwig's angina

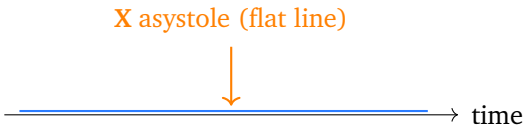
(B) Boerhaave syndrome

(C) Mendelson's syndrome

(D) Ondine's curse

Critical Care, Resuscitation and Pain

Q14. The flat ECG rhythm below is one of the **non-shockable** cardiac arrest rhythms. Its correct ACLS management is:



(A) Immediate defibrillation with a single 200 J shock

(B) Continuous high-quality CPR with adrenaline every 3 to 5 minutes and treatment of reversible causes (no shock)

(C) A synchronised cardioversion

(D) Withhold chest compressions and observe

Q15. The principal life-threatening adverse effect of **opioids** used for postoperative pain, mediated by their action on brainstem mu receptors, is:

(A) Respiratory depression from reduced central sensitivity to carbon dioxide

(B) A rise in blood pressure and tachycardia

(C) Widespread muscle fasciculation

(D) Hyperkalaemia

Detailed Solutions

Q1.

Solution

Concept – predictors of difficult mask ventilation: Difficult mask ventilation is anticipated from a small set of bedside features.

Step 1 – recall the classic predictors: The mnemonic **OBESE** captures them: **O**bese (BMI over 26), **B**earded, **E**dentulous, **S**noring history and **E**lderly (over 55). A patient combining these is the high-risk picture.

Step 2 – why they matter: A beard breaks the mask seal, edentulousness collapses the cheeks, obesity and age raise airway resistance, and snoring signals collapsible soft tissues.

Why the other options are wrong:

- B, young slim clean-shaven with teeth: is the *easy* mask picture.
- C, normal thyromental distance: is reassuring, not a risk factor.
- D, Mallampati class I: predicts an easy view, not difficulty.

Final Answer: Bearded, obese, edentulous, elderly, snorer ⇒ A

Answer: (A) Go Back to Q1

Q2.

Solution

Concept – the thyromental distance: This airway measurement estimates the room available to displace the tongue during laryngoscopy.

Step 1 – recall the threshold: Measured from the thyroid notch to the tip of the chin with the neck fully extended, a distance of **less than 6 cm** (roughly three finger-breadths) predicts a difficult laryngoscopy.

Step 2 – the reasoning: A short distance means a receding mandible with little space to align the oral and pharyngeal axes.

Why the other options are wrong:

- A, less than 12 cm; B, less than 10 cm: these values are normal and reassuring.
- D, less than 2 cm: is anatomically implausible for an adult chin.

Final Answer: Less than 6 cm ⇒ C

Answer: (C) Go Back to Q2

Q3.

Solution

Concept – managing an anticipated difficult airway: When difficulty is predicted before induction, the airway is secured while the patient keeps breathing and protecting it.

Step 1 – choose the technique: Awake fibreoptic intubation with the patient breathing spontaneously is the standard of care, since it preserves ventilation and airway reflexes throughout.

Step 2 – the safety principle: If the tube cannot be passed, the patient is still breathing, avoiding the 'cannot intubate, cannot ventilate' catastrophe.

Why the other options are wrong:

- A, rapid sequence with suxamethonium: abolishes breathing before the airway is confirmed.
- B, deep inhalational then blind nasal: is unreliable with a fixed neck mass.
- C, standard induction with rocuronium: paralyses the patient before the airway is secured.

Final Answer: Awake fibreoptic intubation, spontaneously breathing $\Rightarrow$ D

Answer: (D) Go Back to Q3

Q4.

Solution

Concept – etomidate as a cardiostable induction agent: Etomidate is chosen when haemodynamic stability at induction is paramount.

Step 1 – match the profile: Etomidate causes minimal change in blood pressure and cardiac output, so it suits shocked or cardiac patients, but it produces **myoclonus** and suppresses adrenal steroid synthesis.

Step 2 – the adrenal effect: It inhibits 11-beta-hydroxylase, so even a single dose transiently reduces cortisol production.

Why the other options are wrong:

- A, propofol: causes marked dose-dependent hypotension.
- B, ketamine: is cardiostable but raises heart rate and blood pressure and

causes emergence phenomena, not adrenal suppression.
- C, thiopental: depresses the myocardium and lowers blood pressure.

Final Answer: Etomidate ⇒ D

Answer: (D) Go Back to Q4

Q5.

Solution

Concept – atracurium and Hofmann elimination: Atracurium is the muscle relaxant of choice when both liver and kidney function are impaired.

Step 1 – name the mechanism: Atracurium is broken down by spontaneous **Hofmann elimination**, a non-enzymatic degradation in plasma at body temperature and pH, plus ester hydrolysis.

Step 2 – the clinical advantage: Because clearance is **organ-independent**, its duration is unchanged in renal or hepatic failure.

Why the other options are wrong:

- A, vecuronium: relies on hepatic and renal elimination.
- B, pancuronium: is largely renally excreted and long-acting.
- D, suxamethonium: is a depolarising agent cleared by plasma cholinesterase, not by Hofmann elimination.

Final Answer: Atracurium ⇒ C

Answer: (C) Go Back to Q5

Q6.

Solution

Concept – the blood-gas partition coefficient: This coefficient measures how soluble a volatile agent is in blood, and it governs the speed of induction.

Step 1 – read the schematic: A **low** blood-gas coefficient (**X**, for example desflurane at about 0.42) means little agent dissolves in blood, so the alveolar partial pressure rises quickly and the brain equilibrates fast. This gives a **rapid induction and rapid recovery**.

Step 2 – contrast: A high coefficient (halothane, about 2.4) means blood acts as a large reservoir, slowing the rise in alveolar concentration and prolonging both induction and recovery.

Why the other options are wrong:

- B, slow induction and recovery: describes a *high* coefficient agent.
- C, no effect: solubility is the main determinant of induction speed.
- D, guaranteed cardiac arrest: is unrelated to solubility.

Final Answer: Rapid induction and recovery (desflurane) ⇒ A

Answer: (A) Go Back to Q6

Q7.

Solution

Concept – the mechanism of local anaesthetics: Local anaesthetics stop nerve conduction by blocking a specific channel.

Step 1 – name the target: They block the **voltage-gated sodium channel** from the **intracellular** side, preventing the sodium influx that generates the action potential.

Step 2 – the ester versus amide classification: Esters (procaine, tetracaine) are hydrolysed by plasma cholinesterase; amides (lignocaine, bupivacaine) are metabolised in the liver. Amides characteristically carry two 'i's in their name.

Why the other options are wrong:

- B, potassium channel: is not the primary target of local anaesthetics.
- C, nicotinic acetylcholine receptor: is the target of neuromuscular blockers.
- D, sodium-potassium ATPase: is a pump, not the blocked conduction channel.

Final Answer: Voltage-gated sodium channel ⇒ A

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – spinal versus epidural anaesthesia: Both are neuraxial blocks but differ in site, dose, onset and technique.

Step 1 – state the correct comparison: Spinal anaesthesia places a **small** drug dose directly into the cerebrospinal fluid with a **rapid** onset, whereas **epidural** anaesthesia deposits a **larger** dose into the epidural space with a **slower** onset

and allows a catheter for continuous top-ups.

Step 2 – the practical point: The epidural catheter permits prolonged blocks and postoperative analgesia, which a single-shot spinal cannot provide.

Why the other options are wrong:

- A, spinal slow and epidural immediate: reverses the true onset times.
- C, epidural always smaller dose: is wrong; the epidural dose is larger.
- D, catheter only in subarachnoid space: is wrong; the indwelling catheter is typically epidural.

Final Answer: Small CSF dose rapid onset versus larger epidural dose slower onset with catheter $\Rightarrow$ B

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – the oxygen failure (fail-safe) device: The anaesthesia machine has interlocks that prevent delivery of a hypoxic gas mixture.

Step 1 – state the function: The **oxygen failure device** senses the oxygen supply pressure. If it falls, the device **sounds an alarm and cuts off or reduces nitrous oxide**, so the patient cannot be given a hypoxic mixture.

Step 2 – the wider picture: It works with the hypoxic guard on the flowmeters and the oxygen analyser to guarantee a minimum inspired oxygen.

Why the other options are wrong:

- A, increase nitrous oxide: is the opposite of what the device does.
- B, warm the gases: is the role of a heat and moisture exchanger.
- C, measure end-tidal CO_2: is the role of the capnograph.

Final Answer: Alarms and cuts nitrous oxide when oxygen pressure falls $\Rightarrow$ D

Answer: (D) Go Back to Q9

Q10.

Solution

Concept – arterial blood gas interpretation: A stepwise reading separates respiratory from metabolic disturbances.

Step 1 – read the pH: pH 7.24 is below 7.35, so there is an **acidosis**.

Step 2 – find the cause: The $PaCO_2$ is high at 62 mmHg while the bicarbonate is normal at 24 mmol/L. A raised CO_2 driving the acidosis makes this a **respiratory acidosis**, fitting the hypoventilating patient.

Why the other options are wrong:

- A, metabolic acidosis: would show a low bicarbonate, which is not the case here.
- C, metabolic alkalosis; D, respiratory alkalosis: both need a high (alkalotic) pH, but the pH is low.

Final Answer: Respiratory acidosis $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q10

Q11.

Solution

Concept – the 4-2-1 rule for maintenance fluid: This rule gives the hourly maintenance requirement from body weight.

Step 1 – apply the tiers: 4 mL/kg/h for the first 10 kg, 2 mL/kg/h for the next 10 kg and 1 mL/kg/h for every kilogram beyond 20 kg.

Step 2 – calculate for 22 kg: First 10 kg: $10 \times 4 = 40$ mL/h. Next 10 kg: $10 \times 2 = 20$ mL/h. Remaining 2 kg: $2 \times 1 = 2$ mL/h. Total: $40 + 20 + 2 =$ **62** mL/h.

Why the other options are wrong:

- A, 22 mL/h: applies only the 1 mL/kg tier to the whole weight.
- C, 220 mL/h: applies 10 mL/kg, which is not the rule.
- D, 88 mL/h: applies 4 mL/kg to the whole weight, ignoring the tiers.

Final Answer: 62 mL per hour $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept – perioperative anaphylaxis: Anaphylaxis under anaesthesia is a sudden IgE-mediated collapse.

Step 1 – identify the commonest trigger: Neuromuscular blocking agents are the leading cause of perioperative anaphylaxis, followed by antibiotics and latex.

Step 2 – the first-line treatment: Stop the trigger and give **adrenaline** (intramuscular, or titrated intravenous under monitoring) with oxygen and intravenous fluids; steroids and antihistamines are second-line.

Why the other options are wrong:

- A, volatile agents with hydrocortisone: volatiles are rare triggers and steroids are not first-line.
- B, local anaesthetics with antihistamine: amide local anaesthetic allergy is rare and adrenaline is first-line.
- D, crystalloids with atropine: fluids seldom cause anaphylaxis and atropine is not the treatment.

Final Answer: Neuromuscular blockers; adrenaline first $\Rightarrow$ C

Answer: (C) Go Back to Q12

Q13.

Solution

Concept – acid aspiration pneumonitis: Inhaling acidic gastric contents causes a chemical injury to the lung.

Step 1 – name the syndrome: Chemical pneumonitis from aspirated acid gastric contents is **Mendelson's syndrome**, classically after aspiration of fluid with pH under 2.5 and volume over 25 mL.

Step 2 – the picture: It presents with hypoxia, wheeze and bilateral infiltrates, and is prevented by fasting, cricoid pressure and antacid prophylaxis.

Why the other options are wrong:

- A, Ludwig's angina: is a submandibular space infection.
- B, Boerhaave syndrome: is a spontaneous oesophageal rupture.
- D, Ondine's curse: is a failure of automatic breathing control.

Final Answer: Mendelson's syndrome $\Rightarrow$ C

Answer: (C) Go Back to Q13

Q14.

Solution

Concept – the non-shockable rhythms: Cardiac arrest rhythms split into shockable (VF, pulseless VT) and non-shockable (asystole, PEA).

Step 1 – read the trace: A flat line (**X**) is **asystole**, one of the two **non-shockable** rhythms.

Step 2 – state the management: Non-shockable rhythms are treated with **continuous high-quality CPR, adrenaline 1 mg every 3 to 5 minutes and correction of reversible causes** (the 4 Hs and 4 Ts). No shock is delivered.

Why the other options are wrong:

- A, defibrillation; C, synchronised cardioversion: are for shockable or tachyarrhythmic rhythms, not asystole.
- D, withhold compressions: is wrong; uninterrupted compressions are essential.

Final Answer: CPR with adrenaline every 3 to 5 minutes, no shock $\Rightarrow$ B

Answer: (B) Go Back to Q14

Q15.

Solution

Concept – opioid respiratory depression: Opioids are effective postoperative analgesics but carry a characteristic dangerous effect.

Step 1 – name the effect and mechanism: The principal life-threatening effect is **respiratory depression**, caused by mu-receptor action on the brainstem respiratory centres that **reduces the central ventilatory response to carbon dioxide**.

Step 2 – the clinical consequence: The respiratory rate falls and $PaCO_2$ rises; it is reversed by the antagonist naloxone.

Why the other options are wrong:

- B, rise in blood pressure and tachycardia: opioids tend to lower heart rate and blood pressure.
- C, muscle fasciculation: is a feature of suxamethonium, not opioids.
- D, hyperkalaemia: is not a typical opioid effect.

Final Answer: Respiratory depression from reduced CO_2 sensitivity $\Rightarrow$ A

Answer: (A) Go Back to Q15

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	C	3	D	4	D	5	C
6	A	7	A	8	B	9	D	10	B
11	B	12	C	13	C	14	B	15	A