

JEMAS(PG)-2022

QB No: 2101400001

**Subject: Fellowship in Critical Care Technology (FCCT)**

**Duration: 90 minutes**

**No of MCQ: 100**

**Full Marks: 100**

**Instructions**

1. All questions are of objective type having four answer options for each, carry 1 mark each and only one option is correct. In case of incorrect answer or any combination of more than one answer,  $\frac{1}{4}$  mark will be deducted.
2. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D. Question booklet series code (A, B, C, or D) must be properly marked on the OMR.
3. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
4. Write question booklet number and your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.
5. Write your name (in block letter), name of the examination center and put your full signature in appropriate boxes in the OMR.
6. The OMR is liable to become invalid if there is any mistake in filling the correct bubbles for question booklet number/roll number or if there is any discrepancy in the name/signature of the candidate, name of the examination center. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
7. Candidates are not allowed to carry any written or printed material, calculator, pen, log-table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** and his/her candidature will be summarily cancelled.
8. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
9. Hand over the OMR to the invigilator before leaving the Examination Hall.



1. Which of the following is true about Guillain-Barré syndrome (GBS):
  - (A) Affects more females than males.
  - (B) Is a disease of the middle-aged.
  - (C) When secondary to a respiratory illness, the majority of cases present within a month.
  - (D) The presence of cranial nerve signs effectively rules out the diagnosis
2. In the trauma patient with massive haemorrhage, the following statement is incorrect:
  - (A) An initial target systolic blood pressure of 80-90mmHg is recommended for the patient without brain injury.
  - (B) Desmopressin at a dose of 0.3µg/kg is recommended in the bleeding patient taking platelet-inhibiting drugs.
  - (C) Recombinant factor VIIa (rFVIIa) can be considered as a rescue measure provided the platelet count is greater than  $30 \times 10^9/L$ .
  - (D) Pre-injury warfarin use doubles the odds of death for trauma patients with blunt head injury.
3. The following drugs undergo non-organ metabolism except:
  - (A) Esmolol
  - (B) Atracurium.
  - (C) Inhaled nitric oxide.
  - (D) Propofol.
4. Which of the following features of an asthma attack are classified as 'life-threatening' in the 2011 BTS asthma guideline?
  - (A) Inability to complete sentences in one breath.
  - (B)  $PaO_2$  of  $>8kPa$ .
  - (C) Silent chest.
  - (D)  $PaCO_2 >6kPa$ .
5. Regarding drug-receptor interactions:
  - (A)  $\beta$ -receptor blockers are reversible antagonists.
  - (B) Increasing the dose of a partial agonist can elicit a maximal effect.
  - (C) An antagonist has receptor affinity and intrinsic activity
  - (D) Flumazenil is an inverse agonist.
6. The 2012 Berlin definition of ARDS includes the following components:
  - (A) Continuous positive airway pressure (CPAP) or positive end expiratory pressure (PEEP)  $>5cm H_2O$ .
  - (B) Murray score  $>2$ .
  - (C) Pulmonary artery occlusion pressure less than  $15 cm H_2O$ .
  - (D) pH less than 7.3.
7. Which of the following is not true about regarding the hepatorenal syndrome (HRS):
  - (A) It is commonly over-diagnosed in patients with cirrhotic liver disease.
  - (B) HRS Type 1 has the poorest outcome.
  - (C) Kidneys from patients with HRS are suitable for transplantation.
  - (D) Terlipressin must be given by infusion.

8. A 67-year-old male has a diagnosis of myasthenia gravis (MG). Which of the following medications should be avoided to reduce the risk of exacerbation?
- (A) Ciprofloxacin.
  - (B) Paracetamol.
  - (C) Trimethoprim.
  - (D) Gentamicin.
9. Regarding diagnostic lumbar puncture (LP):
- (A) Suspected bacteraemia is a contraindication to LP.
  - (B) Aspirin should be stopped for at least 24 hours prior to LP.
  - (C) LP is contraindicated in patients with a suspected spinal epidural abscess.
  - (D) It is recommended that LP is not performed in patients with platelet counts of less than  $100 \times 10^9$
10. The following are examples of severity scoring systems in the intensive care unit:
- (A) Acute Physiology and Chronic Health Evaluation III (APACHE III).
  - (B) CT Calcium Score.
  - (C) Sequential Organ Failure Assessment (SOFA).
  - (D) Mortality Prediction Model (MPM).
11. Regarding plasma exchange; not a true statement is:
- (A) It is a highly effective treatment for thrombotic thrombocytopenic purpura.
  - (B) The most commonly used replacement fluid is 4.5% albumin in physiological saline.
  - (C) Therapeutic plasma exchange requires central venous access.
  - (D) Paraesthesia is a common complication.
12. In patients with, or at risk of, acute kidney injury (AKI), international consensus guidelines suggest the following:
- (A) Administration of colloid boluses to expand intravascular volume.
  - (B) Parenteral nutrition should be used in preference to the enteral route in patients with AKI.
  - (C) N-acetyl cysteine (NAC) should not be used for the prevention of post-surgical AKI.
  - (D) Low-dose dopamine has a role in the treatment of established AKI.
13. The incorrect statement with regard to the Medical Research Council-funded CRASH trials:
- (A) The CRASH 1 trial examined the role of steroids in traumatic brain injury (TBI).
  - (B) The CRASH 2 trial assessed the role of tranexamic acid in traumatic brain injury (TBI) within a pilot sample.
  - (C) The CRASH 3 trial is designed to assess the effectiveness of tranexamic acid in TBI within a multicentre cohort.
  - (D) It may be referred to other sites The CRASH 3 trial is designed to assess the effectiveness of tranexamic acid in TBI within a multicentre cohort. Paper 1  
Paper 1 Questions 9.

14. All of the following are true about thrombotic thrombocytopenic purpura (TTP) except:
  - (A) Platelet transfusion is recommended to maintain a platelet count of  $>10 \times 10^9/L$ .
  - (B) The principal abnormality occurs due to the production of an abnormal vWF cleaving protein.
  - (C) The diagnostic pentad includes microangiopathic haemolytic anaemia.
  - (D) Administration of solvent/detergent-treated fresh frozen plasma is a useful treatment option.
15. In a patient with acute severe tricyclic antidepressant poisoning; wrong statement is:
  - (A) A dominant R-wave  $>3mm$  is often seen in lead aVR.
  - (B) QRS prolongation is a useful prognostic feature and should be routinely measured.
  - (C) First-line treatment for acute dysrhythmia should include a 2-4g bolus of magnesium sulphate.
  - (D) Intralipid® can be used as a rescue measure.
16. Regarding the physiology of the donor heart following cardiac transplantation:
  - (A)  $\beta$ -adrenergic blockers will have no effect on the heart rate.
  - (B) The Valsalva manoeuvre will have no effect on heart rate.
  - (C) The post-cardiac transplant patient can suffer anginal pain.
  - (D) The heart rate will not increase during exercise unless a pacemaker is fitted.
17. The following is not a recognized complication of therapeutic hypothermia:
  - (A) Pneumonia.
  - (B) Coagulopathy.
  - (C) Hypoglycaemia.
  - (D) Sepsis.
18. First step in WHO Pain ladder, consists of;
  - (A) The absence of myoglobinuria excludes the diagnosis.
  - (B) Administration of sodium bicarbonate and mannitol are the mainstays of treatment.
  - (C) Alkalinisation of the urine aims to increase the solubility of the Tamm-Horsfall protein-myoglobin complex.
  - (D) Bicarbonate should be titrated to a urinary pH  $>9$ .
19. A patient presents with a paracetamol overdose. The following factors would increase the chances of severe hepatotoxicity except:
  - (A) Regular consumption of ethanol in excess of recommended amounts.
  - (B) Use of hepatic enzyme inhibitors.
  - (C) Malnourishment.
  - (D) St John's Wort.

20. With respect to the tumour lysis syndrome (TLS):
  - (A) High-dose intravenous steroid therapy is a reasonable initial treatment option
  - (B) TLS is most commonly associated with squamous cell and neuroendocrine tumours.
  - (C) Clinical TLS can be diagnosed in a patient with seizures and the presence of appropriate laboratory findings.
  - (D) An increase in serum calcium and potassium levels by >25% is the hallmark feature of laboratory TLS.
21. The following are diagnostic features of submassive pulmonary embolism (PE):
  - (A) Systolic blood pressure less than 90 mmHg.
  - (B) Elevated troponin.
  - (C) B-natriuretic peptide (BNP) level of less than 10 pg/ml.
  - (D) SpO<sub>2</sub> less than 94% in room atmosphere.
22. Regarding the diagnosis of brainstem death, incorrect statement is:
  - (A) The absence of corneal reflex indicates no function in the midbrain region.
  - (B) The visual evoked responses must be demonstrated to be absent
  - (C) Motor response to a sternal rub excludes the diagnosis.
  - (D) A cough reflex response to bronchial stimulation by a suction catheter placed down the trachea to the carina excludes the diagnosis.
23. The following factors cause inaccuracy in pulse oximetry except:
  - (A) Methaemoglobinaemia.
  - (B) Carbon monoxide poisoning.
  - (C) Vasopressors.
  - (D) Acrylic nails.
24. The following are not considered useful management options in the treatment of thrombotic thrombocytopenic purpura (TTP):
  - (A) Intravenous immunoglobulin.
  - (B) Steroid therapy.
  - (C) Monoclonal antibody infusion.
  - (D) Fresh frozen plasma.
25. The following are appropriate for the resuscitation of the average 4-year-old child
  - (A) Size 5 uncuffed endotracheal tube.
  - (B) In the case of witnessed ventricular fibrillation, synchronised defibrillation at 64 Joules.
  - (C) Lorazepam 1.6mg/kg IV for the emergency treatment of convulsions.
  - (D) Atropine 640µg for the emergency treatment of bradycardia suspected to be due to vagal overactivity.

26. The following have been demonstrated to be useful prognostic variables in moderate to severe traumatic brain injury
  - (A) Age.
  - (B) Pupillary reaction.
  - (C) Sensory neurological deficit.
  - (D) The presence of non-evacuated haematoma on CT brain scan.
27. The 2012 Berlin definition of ARDS includes the following components:
  - (A) Continuous positive airway pressure (CPAP) or positive endexpiratory pressure (PEEP) >5cm H<sub>2</sub>O.
  - (B) Murray score >2.
  - (C) Pulmonary artery occlusion pressure <15cm H<sub>2</sub>O.
  - (D) pH <7.3.
28. Regarding viral encephalitis:
  - (A) It is commonly caused by the mumps virus.
  - (B) The disease usually affects the parietal lobes.
  - (C) CT of the brain is a useful investigation in suspected cases.
  - (D) Herpes simplex encephalitis has a mortality rate of up to 70% if untreated .
29. Giving your patient a FAST-HUG means paying strict attention to the following except:
  - (A) Falls prevention.
  - (B) Humidification of ventilatory support.
  - (C) Tracheostomy care.
  - (D) Stress ulcer prophylaxis.
30. The following are considered risk factors for aneurysmal subarachnoid haemorrhage:
  - (A) Smoking history.
  - (B) Ehlers-Danlos syndrome.
  - (C) Pregnancy.
  - (D) Hypotension.
31. When using intra-aortic balloon (IABP) counterpulsation to treat cardiogenic shock, the intervention will achieve all of the following EXCEPT:
  - (A) Improvement in coronary perfusion.
  - (B) Increase left ventricular stroke work index.
  - (C) Reduction in afterload.
  - (D) Increase in diastolic blood pressure.
32. Regarding non-invasive ventilation (NIV) in critically ill patients true statement is:
  - (A) It has a clear mortality benefit in patients with Type I respiratory failure due to chronic obstructive pulmonary disease (COPD) compared with standard medical therapy.
  - (B) It is contraindicated in patients with thoracic wall deformities.
  - (C) It is an effective treatment for severe community-acquired pneumonia.
  - (D) None of the above.

33. Regarding the anterior triangle of the neck:
  - (A) It is bounded anteriorly by the sternocleidomastoid muscle.
  - (B) The trachea lies deep to the anterior triangle.
  - (C) Skin is punctured within the anterior triangle when using a landmark technique for internal jugular central venous access.
  - (D) The common carotid artery can be palpated in the anterior triangle at the inferior border of the mandible.
34. Causes of hypercalcaemia include all except:
  - (A) Multiple endocrine neoplasia (MEN) Type IIb.
  - (B) Theophylline toxicity.
  - (C) Hyperthyroidism.
  - (D) Immobilisation.
35. Regarding vascular access during cardiopulmonary resuscitation (CPR); false is:
  - (A) If intravenous access cannot be secured within the first 2 minutes of CPR, intraosseous access should be considered.
  - (B) Peripherally injected drugs should be flushed with at least 20ml of fluid.
  - (C) Drug doses should be doubled if delivered via the intraosseous route.
  - (D) Tracheal drug administration is no longer recommended.
36. Incorrect regarding the use of a laryngeal mask airway (LMA):
  - (A) It can be easily inserted without neuromuscular blockade..
  - (B) Is highly effective in maintaining a patent airway.
  - (C) It can be used with positive pressure ventilation.
  - (D) Is contraindicated with muscle relaxants
37. Evidence-based rescue strategies shown to reduce mortality in severe acute respiratory distress syndrome (ARDS) include the following:
  - (A) Paralysis using non-depolarising muscle relaxants.
  - (B) Therapeutic hypothermia.
  - (C) High-frequency oscillatory ventilation.
  - (D) Airway pressure release ventilation.
38. Life-threatening chest injuries which should be addressed in the primary survey according to Advanced Trauma Life Support (ATLS) guidelines include:
  - (A) Oesophageal ruptures.
  - (B) Cardiac tamponade.
  - (C) Traumatic aortic disruption.
  - (D) Traumatic diaphragmatic injury.
39. With regard to statistics and evidence-based medicine:
  - (A) An odds ratio is equivalent to a risk ratio..
  - (B) Absolute risk reduction (ARR) is the only value required to calculate the number needed to treat (NNT).
  - (C) A Type I error reflects a false-negative result.
  - (D) A funnel plot is used to represent heterogeneity within a systematic review.



40. The following are true of trauma scoring systems:
- (A) An Abbreviated Injury Scale (AIS) score of 1 denotes an unsurvivable injury.
  - (B) The maximum value obtainable for the Injury Severity Score (ISS) is 50..
  - (C) The Revised Trauma Score (RTS) is an anatomical scoring system.
  - (D) None of the above.
41. In paediatric advanced life support, the following formulae are not relevant and considered accurate:
- (A) The weight of a 3-year-old child can be calculated using the formula  $(2 \times \text{age in years}) + 8$ .
  - (B) Amiodarone for refractory ventricular tachycardia (VT) is dosed at 5mg/kg.
  - (C) Ceftriaxone for meningococcal septicaemia is dosed at 80mg/kg.
  - (D) The internal diameter of a suitable endotracheal tube is calculated by  $\text{age}/2 + 4$ .
42. Clinical feature of Fibromyalgia include all except
- (A) The patient should have three plain view cervical radiographs as first-line imaging.
  - (B) Following a normal CT of the cervical spine, the chance of unstable injury requiring neurosurgical intervention or ongoing immobilization is less than 1%.
  - (C) Three-point immobilisation is supported by level I evidence to improve outcome.
  - (D) Aspen collars are preferred to hard collars for soft tissue neck injury.
43. Regarding hypertrophic cardiomyopathy (HCM):
- (A) It is the most common cause of spontaneous cardiac arrest in young athletes.
  - (B) It is characterised by severe left ventricular hypertrophy in association with aortic stenosis.
  - (C) The most common echocardiographic characteristic is systolic anterior motion of the anterior aortic valve leaflet with left ventricular outflow obstruction..
  - (D)  $\beta$ -blockers are relatively contraindicated.
44. Regarding a patient with a penetrating neck injury:
- (A) The platysma may or may not be breached.
  - (B) Multidetector CT imaging is very sensitive for the detection of clinically significant vascular injury.
  - (C) The patient should be immediately immobilised in a hard collar.
  - (D) Dysphonia is an indication for urgent surgical exploration.
45. The following ECG feature does not support a diagnosis of right ventricular hypertrophy:
- (A) Axis deviation of  $+110^\circ$  or more.
  - (B) R-wave 8mm tall in V1.
  - (C) R/S ratio  $<1$  in lead V5 or V6.
  - (D) Bifid P-waves.

46. Which of the following are recommended as drugs to terminate status epilepticus in the adult patient according to NICE guidelines?
- (A) Sodium valproate.
  - (B) Suxamethonium.
  - (C) Ketamine.
  - (D) Propofol.
47. The following are validated tools in predicting outcome post-cardiac arrest:
- (A) N20 somatosensory evoked potential from the median nerve.
  - (B) Glasgow Coma Scale (GCS) at 24 hours.
  - (C) CT brain consistent with hypoxic brain injury.
  - (D) Fixed dilated pupils on admission to the intensive care unit.
48. A man is admitted to your ICU with acute liver failure. The following criteria must be met to fulfil a diagnosis of acute liver failure:
- (A) Illness duration <28 days.
  - (B) Presence of chronic liver disease.
  - (C) Jaundice.
  - (D) Coagulopathy with an INR >1.5.
49. Regarding the principles and practical aspects of pulse oximetry:
- (A) Pulse oximetry uses three lights of different absorption spectra to measure blood oxygen saturations.
  - (B) Oximeters are inaccurate at a saturation of <80%.
  - (C) A pulse oximeter can distinguish between carboxyhaemoglobin and oxyhaemoglobin.
  - (D) Oxyhaemoglobin is overestimated when elevated levels of methaemoglobin are present.
50. The following variables are used in the calculation of the Acute Physiology and Chronic Health Evaluation (APACHE) II score:
- (A) Systolic blood pressure.
  - (B) Temperature.
  - (C) Serum calcium.
  - (D) Gender.
51. The following are causes of a raised anion gap metabolic acidosis:
- (A) Lactic acidosis.
  - (B) Externally draining pancreatic fistula.
  - (C) Excessive infusion of normal saline.
  - (D) Urinary diversion.

52. Regarding the principles of invasive blood pressure monitoring; which is incorrect:
- (A) The risk of thrombus formation is greater with a wide-bore arterial cannula.
  - (B) The addition of extra tubing and three-way-taps to the system cause an increase in damping.
  - (C) Overdamping has no effect on the reading of mean arterial pressure.
  - (D) The transducer must be at the level of the heart when the system is zeroed.
53. The following preconditions must be met before brainstem death testing can be undertaken on the intensive care unit except:
- (A) pH 7.35 to 7.45.
  - (B) Core temperature  $>34^{\circ}\text{C}$ .
  - (C) Serum potassium  $>2\text{mmol/L}$ .
  - (D) Serum sodium  $>125\text{mmol/L}$ .
54. The following are risk factors for the development of a pulmonary embolism except:
- (A) Heparin-induced thrombocytopenia.
  - (B) General anaesthesia for  $>30$  minutes.
  - (C) Antiphospholipid antibodies.
  - (D) Immune thrombocytopenia.
55. Regarding serotonin syndrome (SS):
- (A) Cyproheptadine is a precipitating cause.
  - (B) It has no extrapyramidal signs.
  - (C) Onset is typically over a period of several days.
  - (D) Ondansetron is a method of treatment.
56. Regarding intensive care unit delirium, which of the following statements are true?
- (A) ICU delirium occurs in 30-45% of ICU patients.
  - (B) It is commonly over-diagnosed.
  - (C) The hyperactive form is the most common.
  - (D) The CAM-ICU test requires knowledge of the patient's sedation score.
57. The following results of the cerebrospinal fluid (CSF) analysis are characteristic in Guillain-Barré syndrome (GBS):
- (A) Monoclonal bands.
  - (B) Protein  $<0.5\text{g/L}$ .
  - (C) CSF glucose  $>2/3$  of plasma glucose.
  - (D) Lymphocytosis.
58. Regarding the Sengstaken-Blakemore tube and its use in upper gastrointestinal variceal haemorrhage:
- (A) It has four ports.
  - (B) Must be stored at  $4^{\circ}\text{C}$ .
  - (C) Requires insertion via the oral route.
  - (D) Rebleeding is common after deflation of the gastric balloon.

59. Which of the following are causes of raised pulmonary artery occlusion pressure (PAOP) except?
- (A) Right ventricular failure.
  - (B) Aortic stenosis.
  - (C) Mitral regurgitation.
  - (D) Mitral stenosis.
60. Which of the following are common features of 3, 4-methylene-oxyamphetamine (MDMA or ecstasy) toxicity?
- (A) Hepatotoxicity.
  - (B) Hypernatraemia.
  - (C) Hypothermia.
  - (D) Postural hypotension.
61. The following is not an independent variable in Stewart's acid-base hypothesis:
- (A)  $p\text{CO}_2$
  - (B)  $\text{HCO}_3^-$
  - (C) ATOT
  - (D) Strong ion difference (SID).
62. Regarding the physiology of the lungs during mechanical ventilation; the wrong is:
- (A) Normal static lung compliance is 50-100ml/cmH<sub>2</sub>O.
  - (B) Plateau pressure = Pcompliance - Presistance.
  - (C) Volume-controlled ventilation produces a square inspiratory flow pattern.
  - (D) Ventilation is greater at the lung bases in healthy spontaneously breathing individuals.
63. During early rhabdomyolysis all of the features listed are typical EXCEPT:
- (A) Raised creatine kinase.
  - (B) Red cell casts on urine microscopy.
  - (C) Hypocalcaemia.
  - (D) Blood +++ on urinalysis.
64. A man is admitted with a severe chest infection. He consents to a HIV test. Which of the following is not an AIDS-defining illness?
- (A) Mycobacterium tuberculosis.
  - (B) Kaposi's sarcoma.
  - (C) Cerebral lymphoma.
  - (D) Oral candidiasis.
65. The following are considered risk factors for intensive care unit-acquired weakness (ICUAW):
- (A) Hypoglycaemia.
  - (B) Male gender.
  - (C) Alcohol excess.
  - (D) Severe sepsis.

66. With regards to the use of vasopressin in patients with septic shock, incorrect is:
- (A) Vasopressin is synthesised in the posterior pituitary.
  - (B) Endogenous vasopressin levels are typically low in patients with septic shock.
  - (C) It increases smooth muscle intracellular calcium.
  - (D) Vasopressin infusion is effective in reducing noradrenaline requirements in patients with septic shock.
67. Regarding the anatomy of the larynx and trachea:
- (A) The cricoid cartilage is situated at the level of C4.
  - (B) The cricotracheal membrane is the preferred site for cricothyrotomy..
  - (C) An aortic aneurysm can cause paralysis of the left vocal cord.
  - (D) In an adult the trachea is approximately 10cm long.
68. The following are complications of the treatment of diabetic ketoacidosis except:
- (A) Hypomagnesaemia.
  - (B) Cerebral oedema.
  - (C) Hyperphosphatemia.
  - (D) Hyperchloraemic acidosis.
69. The following is not a recognised causes of a normal anion gap metabolic acidosis:
- (A) Ureteroenterostomy.
  - (B) Administration of excess normal saline solution.
  - (C) Addison's disease.
  - (D) Diabetic ketoacidosis.
70. The following are causes of prolongation of the corrected QT interval (QTc):
- (A) Atenolol.
  - (B) Hypercalcaemia.
  - (C) Subarachnoid haemorrhage.
  - (D) Hyperthermia.
71. When performing a lumbar puncture, incorrect statement is:
- (A) In an adult a lumbar puncture can safely be performed at the level of L2/3..
  - (B) Cerebrospinal fluid is located in the epidural space.
  - (C) When performing a lumbar puncture in the sitting position, a normal opening pressure is 20-40cm of cerebrospinal fluid.
  - (D) Cerebrospinal fluid has an osmolality of approximately 280mOsm/kg.
72. Which of the following is not true regarding arterial pressure waveform analysis?
- (A) The dicrotic notch represents aortic valve closure.
  - (B) Vasoconstriction is suggested by a steep slope of systolic decay.
  - (C) The rate of rise in pressure per unit time (dP/dt) is an index of contractility.
  - (D) A large delta ( $\Delta$ ) down in a ventilated patient suggests hypovolaemia.
73. When using a pulmonary artery catheter, the following are directly measured variables:
- (A) Left atrial pressure.
  - (B) Cardiac index.
  - (C) Oxygen delivery.
  - (D) Mixed venous SaO<sub>2</sub>.

74. Regarding the mechanism of action of drugs via receptors and second messenger systems, incorrect is:
- (A) Suxamethonium works on a ligand gated ion channel.
  - (B) Thyroxine works via the tyrosine kinase system.
  - (C) Gi receptors cause an increase in activity of adenylate cyclase.
  - (D) Nitric oxide increases the levels of intracellular cyclic guanosine monophosphate (cGMP).
75. The following should not be used to reduce the incidence of clotting in the haemofilter circuit:
- (A) Reduce the pre-dilution to a post-dilution ratio.
  - (B) Fondaparinux.
  - (C) Albumin.
  - (D) Citrate.
76. Concerning the use of the oesophageal Doppler probe for cardiac monitoring in the ICU; wrong statement is:
- (A) The monitor assumes that 70% of total stroke volume enters the descending aorta.
  - (B) FTc is corrected to a heart rate of 60bpm.
  - (C) Probe placement is contraindicated in cribriform plate fracture.
  - (D) A high FTc suggests vasoplegia.
77. The dosing schedule of the following antimicrobial agents should be modified in patients with chronic kidney disease (CKD) stage 3:
- (A) Tazocin.
  - (B) Metronidazole.
  - (C) Meropenem.
  - (D) Amphotericin.
78. With regard to the intra-aortic balloon pump:
- (A) Balloon inflation is timed to coincide with the dicrotic notch on the aortic waveform trace.
  - (B) Increased afterload leads to increased coronary perfusion pressure.
  - (C) The balloon is inflated with air.
  - (D) The balloon is positioned proximal to the left subclavian artery.
79. Which of the following is not true regarding arterial blood gas analysis:
- (A) The pH of a gas sample is directly measured.
  - (B) All arterial blood gas samples are measured at 37°C +/- 0.1°C.
  - (C) The blood gas analyser will underestimate the true in vivo PaCO<sub>2</sub> of a hypothermic patient.
  - (D) Bubbles of air in the gas syringe will affect the measured PaO<sub>2</sub>.
80. During a respiratory wean, the following numerical indices suggest a spontaneous breathing trial is likely to be followed by successful extubation
- (A) Rapid Shallow Breathing Index (RSBI) <105
  - (B) Vital capacity >5ml/kg.
  - (C) PO<sub>2</sub> >10kPa.
  - (D) ET-CO<sub>2</sub> <5kPa.

81. The application of continuous positive airway pressure (CPAP) or positive end-expiratory pressure (PEEP) typically leads to all except:
- (A) Increased functional residual capacity..
  - (B) A reduction in preload in patients with acute cardiogenic pulmonary oedema..
  - (C) Redistribution of extravascular lung water.
  - (D) Increased cardiac output.
82. In the patient with major burns:
- (A) Selective decontamination of the digestive tract has been demonstrated to reduce the incidence of burn wound infection.
  - (B) The first half of the fluid requirement as calculated by the Parkland formula should be administered over 12 hours.
  - (C) Pre-hospital fluid should be subtracted from the fluid requirement as calculated by the Parkland formula.
  - (D) Erythematous areas should be included in the total body surface area (TBSA) calculation.
83. Which of the following is not expected following a significant overdose of amitriptyline?
- (A) Metabolic acidosis.
  - (B) Seizures.
  - (C) Hyperthermia.
  - (D) Urinary retention.
84. The following poisons is incorrectly matched with potential antidotes:
- (A) Methanol = fomepizole.
  - (B) Cyanide = sodium thiosulphate.
  - (C)  $\beta$ -blockade = salbutamol.
  - (D) Organophosphates = pralidoxime.
85. The following are components of the CAM-ICU delirium screening tool:
- (A) Ingestion of deliriogenic medication in the last 24 hours.
  - (B) Evidence of inattention on testing.
  - (C) Abbreviated mental test score  $<6$ .
  - (D) Non-compliance with therapy in the last 24 hours.
86. Which of the following is example of Gram-negative bacteria?
- (A) Bacillus.
  - (B) Streptococci.
  - (C) Clostridium.
  - (D) Haemophilus.
87. The following are recognised causes of isotonic hyponatraemia:
- (A) The syndrome of inappropriate antidiuretic hormone secretion (SIADH).
  - (B) Glycine absorption during urological surgery.
  - (C) Addison's disease.
  - (D) Beer potomania.

88. A 45-year-old man is extricated out of the local canal after drowning. He has severe hypothermia. Which of these features would be expected on his ECG?
- (A) Atrial fibrillation.
  - (B) Short PR interval.
  - (C) Bradyarrhythmia.
  - (D) Ventricular ectopics.
89. The following are recommended initial treatment options in the management of severe symptomatic hypotonic hyponatraemia of indeterminate onset:
- (A) Administration of 3% hypertonic saline.
  - (B) Desmopressin.
  - (C) Conivaptan.
  - (D) Demeclocycline.
90. Which of the following are features of acute aortic dissection on a plain chest X-ray except?
- (A) Pleural capping.
  - (B) Right-sided pleural effusion.
  - (C) Calcium sign.
  - (D) Tracheal shift.
91. Regarding the patient with necrotising fasciitis:
- (A) Type 2 is of fungal aetiology.
  - (B) Most infections are single-organism clostridial species.
  - (C) Clindamycin is usually recommended as empirical Gram-negative coverage.
  - (D) Scoring systems based on laboratory values can usefully distinguish between necrotising fasciitis and other soft tissue infections.
92. The following infectious diseases are notifiable to local authority proper officers:
- (A) Haemolytic uraemic syndrome.
  - (B) Tetanus.
  - (C) Acute viral meningitis.
  - (D) All of the above.
93. Regarding the diagnosis of diabetic ketoacidosis (DKA), the following diagnostic criterion does not apply:
- (A) Plasma bicarbonate  $>15\text{mmol/L}$ .
  - (B) Venous pH  $<7.3$
  - (C) Serum osmolarity  $\geq 320\text{mOsm/kg}$ .
  - (D) Blood glucose  $>20\text{mmol/L}$ .
94. Regarding the mode of action of oral and parenteral anticoagulants:
- (A) Dabigatran is a direct thrombin inhibitor.
  - (B) Bivalirudin is a direct Factor Xa inhibitor.
  - (C) Fondaparinux is an indirect thrombin inhibitor.
  - (D) Rivaroxiban is a direct thrombin inhibitor.



95. Which of the following qualities is most essential when designing a scoring system to assess risk of mortality in critically ill patients?
- (A) Validity.
  - (B) Generalisability.
  - (C) Complexity of statistical modelling.
  - (D) Discrimination.
  - (D) Simplicity of variables.
96. An 18-year-old woman is admitted with a 2-week history of a sore throat and headache. She is pyrexial at 38°C. She has deranged liver function tests and splenomegaly on examination. Which of the following tests is most likely to prove diagnostic?
- (A) Lumbar puncture and urgent Gram stain.
  - (B) CT head.
  - (C) Blood cultures.
  - (D) Monospot test.
97. A young patient on the unit has an unexplained metabolic acidosis and has been on a large dose of propofol for the last 3 days. The diagnosis of propofol infusion syndrome (PRIS) is considered. Which of the following features is most consistent with this?
- (A) Widespread T-wave inversion.
  - (B) Bradycardia.
  - (C) High transaminase levels.
  - (D) Jaundice.
98. Which of the following interventions has shown the most potential benefit in reducing the rate of contrast-induced nephropathy (CIN) in critically ill patients with acute kidney injury undergoing CT imaging with contrast?
- (A) Intravenous crystalloid loading.
  - (B) Intravenous N-acetylcysteine.
  - (C) Use of a D1 receptor agonist.
  - (D) Low-dose dopamine infusion.
99. In a haemodynamically stable 20-year-old male presenting with blunt chest trauma: the best screening test for diagnosis of cardiac injury requiring treatment is:
- (A) Chest X-ray.
  - (B) Serum CK-MB levels.
  - (C) Standard 12-lead ECG.
  - (D) Transthoracic echocardiography.
100. The least desirable position for the tip of a central venous catheter which has been inserted into the left internal jugular vein is:
- (A) Midway along the left brachiocephalic vein.
  - (B) At the junction of left brachiocephalic vein and the superior vena cava.
  - (C) In the SVC at the level of the carina.
  - (D) At the junction of SVC and the right atrium.

