ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

Ph.D. (CARDIOVASCULAR BIOLOGY)

COURSE CODE : 163

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 163

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) or (E) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Familial hypertrophic cardiomyopathy is most likely to be secondary to a mutation in:

(A) Myosin regulatory proteins
(B) Myosin binding protein-C
(C) Myosin light chains
(D) Troponin I
(E) Troponin T

2. Which of the following tests can assess risk or indicate prognosis?

(A) CK-MB
(B) myoglobin
(C) Troponin
(D) CK-Isoforms
(E) CK Index

3. Troponin T is a sensitive and specific marker for

(A) Typical angina
(B) Crescendo angina
(C) Myocardial infarction
(D) Arrhythmia
(E) Prinzmetal's angina

4. In a heart transplant recipient, each of the following statements is true EXCEPT

(A) Sinus tachycardia at rest can be normal
(B) The effect of atropine is exaggerated in the denervated heart
(C) The response to -adrenergic drugs is normal or increased
(D) The ECG is often read as atrial fibrillation or flutter
(E) The patient will be immuno-suppressed for life

5. Which part(s) of the heart pump(s) blood to the lungs?

(A) Left ventricle
(B) Right atrium
(C) Right ventricle
(D) Both ventricles
(E) Left atrium

6. The heart wall is

(A) made up solely of pericardium and myocardium.
(B) supplied with food and oxygen by the blood passing through the atria and ventricles.
(C) made of three layers: epicardium, myocardium and endocardium
(D) made of skeletal muscle fibres receiving special innervation from the pacemaker.
(E) nourished by the secretions from the pericardial sac.

7. Which of the following regarding the pericardium is true?

(A) The fibrous layer adheres to the heart muscle.

(B) The pericardial cavity is the space between the lungs occupied by the heart.

(C) The visceral layer of the serous pericardium is attached to the myocardium.

(D) A thin layer of serous fluid is formed between fibrous pericardium and serous pericardium.

(E) The fibrous layer is called the epicardium.

8. Which of the following is NOT part of the conduction system of the heart?

(A) AV bundle

(B) SA node

(C) AV valve

(D) Purkinje fibres

(E) AV node

9. The atrioventricular valves

(A) are the aortic and the mitral valves.

(B) have chordae tendineae attached to the inner walls of the atria.

(C) open when the ventricles contract.

(D) prevent backflow of blood into the atria.

(E) are closed during diastole

10. Inside the heart are structures called chordae tendineae. They

(A) are also called trabeculae carnae.

(B) extend from papillary muscles to the cusps of the atrioventricular valves.

(C) are the pointed middle parts of the atrio-ventricular valves.

(D) are irregular endocardial strands on the inner walls of the atria.

(E) extend from the interventricular septum to the outer ventricular walls.

11. The P wave of a normal electrocardiogram indicates

(A) atrial depolarisation

(B) sino-atrial depolarisation

(C) ventricular depolarisation

(D) atrial repolarisation

(E) ventricular repolarisation

7. Which of the following regarding the pericardium is true?

(A) The fibrous layer adheres to the heart muscle.

(B) The pericardial cavity is the space between the lungs occupied by the heart.

(C) The visceral layer of the serous pericardium is attached to the myocardium.

(D) A thin layer of serous fluid is formed between fibrous pericardium and serous pericardium.

(E) The fibrous layer is called the epicardium.

8. Which of the following is NOT part of the conduction system of the heart?

(A) AV bundle

(B) SA node

(C) AV valve

(D) Purkinje fibres

(E) AV node

9. The atrioventricular valves

(A) are the aortic and the mitral valves.

(B) have chordae tendineae attached to the inner walls of the atria.

(C) open when the ventricles contract.

(D) prevent backflow of blood into the atria.

(E) are closed during diastole

10. Inside the heart are structures called chordae tendineae. They

(A) are also called trabeculae carnae.

(B) extend from papillary muscles to the cusps of the atrioventricular valves.

(C) are the pointed middle parts of the atrio-ventricular valves.

(D) are irregular endocardial strands on the inner walls of the atria.

(E) extend from the interventricular septum to the outer ventricular walls.

11. The P wave of a normal electrocardiogram indicates

(A) atrial depolarisation

(B) sino-atrial depolarisation

(C) ventricular depolarisation

(D) atrial repolarisation

(E) ventricular repolarisation

12. What causes the aortic and pulmonary valves to close?

(A) Backflow of blood from the coronary sinus.

(B) Atrial systole.

(C) Ventricular systole.

(D) Ventricular pressure greater than arterial pressure.

(E) Blood pressure in the aorta and pulmonary trunk greater than ventricular pressure.

13. Which of the following is THE BEST definition or a determination of cardiac output?

(A) Cardiac minute output times beats per minute.

(B) Amount of blood ejected from the left ventricle in each systole.

(C) Amount of blood ejected from both ventricles in each systole.

(D) Amount of blood moving into the aorta each minute.

(E) Difference between the amount of blood moving through the heart at rest and at maximum activity.

14. Which of the following decreases the rate of contraction of the heart?

(A) Stretching of myocardial fibers of the ventricles.

(B) Sympathetic impulses from the cardiac control center.

(C) Stimulation of baroreceptors in certain arteries and veins.

(D) Parasympathetic stimulation.

(E) Release of norepinephrine from sympathetic neurons.

15. The tricuspid valve is closed

(A) while the ventricle is in diastole.

(B) only in cardiac arrest.

(C) while the atrium is contracting.

(D) when the ventricle is in systole.

(E) by the movement of blood from atrium to ventricle.

16. A small mass of specialized neuromuscular tissue embedded in the wall of the right atrium close to the point of entry of the superior vena cava receives nervous impulses via the autonomic nervous system. The tissue referred to is called the

(A) Bundle of His

(B) Atrioventricular node.

(C) AV bundle

(D) Sinoatrial node.

(E) Purkinje network

17. In normal heart action
    (A) the two atria contract together, then the two ventricles contract.
    (B) the right atrium and ventricle contract, followed by contraction of the left atrium and ventricle.
    (C) all four chambers of the heart are in systole together, followed by diastole.
    (D) none of these options is correct.
    (E) these structures contract in sequence: right atrium, right ventricle, left atrium, left ventricle.

18. During each cardiac cycle
    (A) blood is forced all around the body and back to the heart again.
    (B) the blood flowing through the heart chambers supplies the heart muscle with nutrition and oxygen.
    (C) impulses spread from the pacemaker to the ventricles, then up to the atria, to complete the cycle.
    (D) the sounds heard with a stethoscope are those of the muscular contractions of the heart walls.
    (E) the sounds heard with a stethoscope are the closing of the heart valves.

19. The first heart sound (the "lubb" of "lubb-dupp") is caused by the
    (A) contraction of the two atria.
    (B) closure of the mitral and tricuspid valves.
    (C) closure of the two semilunar valves.
    (D) contraction of both ventricles.
    (E) contraction of the right ventricle.

20. The heart is innervated by the
    (A) greater and lesser splanchnic nerves
    (B) nerve fibers from the brachial plexus
    (C) vagus and sympathetic nerves
    (D) sympathetic nerves only
    (E) vagus nerves only

21. The fact that the left ventricular wall is thicker than the right reveals that it...
    (A) expands the thoracic cage.
    (B) pumps a greater volume of blood.
    (C) all of these options.
    (D) pumps blood through a smaller valve.
    (E) pumps blood against a greater resistance.

22. The P wave is due to which of the following electrical events within the heart?

(A) atrial repolarisation
(B) atrial depolarisation.
(C) ventricular depolarisation
(D) ventricular repolarisation.

23. The QRS wave is due to which of the following electrical events within the heart?

(A) ventricular repolarisation.
(B) ventricular depolarisation.
(C) atrial depolarisation.
(D) atrial repolarisation.

24. The T wave is due to which of the following electrical events within the heart?

(A) atrial depolarisation.
(B) ventricular depolarisation.
(C) ventricular repolarisation.
(D) atrial repolarisation.

25. A 45-year-old man with a strong family history of ischaemic heart disease presents with atypical chest pains. Stress echocardiography is organised. What pharmacologic agent is likely to be used to produce cardiovascular stress during stress echocardiography in this patient?

(A) dipyridamole (B) dobutamine (C) adenosine (D) arbutamine
(E) atropine sulfate

26. A patient has persist >2mm ST elevation in V2-6 two hours following a myocardial infarction, with hypertension of 205/115, he has already been given morphine and aspirin , what is the next management of choice?

(A) IV Nitroglycerine
(B) Double-bolus r-PA
(C) IV GTN
(D) IV streptokinase
(E) Subcutaneous heparin

27. The treatment of choice for recurrent transient ischemic attacks in a patient on aspirin with new-onset atrial fibrillation

(A) Anticoagulation
(B) Carotid endarterectomy
(C) Clopidogrel
(D) Corticosteroid treatment
(E) Carotid stent

28. Digitalis glycosides slows the heart rate in patients with systolic dysfunction as a result of all of the following EXCEPT:

(A) direct action of digitalis on the AV node to slow conduction
(B) indirect effect of enhanced vagal tone on AV node
(C) enhanced parasympathetic outflow from the CNS through an indirect mechanism.
(D) diminished sympathetic tone which is high as a compensatory mechanism in heart failure
(E) enhanced responsiveness of the SA and AV node to norepinephrine through an indirect mechanism

29. Which of the following drug-mechanism of action pairs is properly matched?

(A) digoxin – inhibits Na+ – K+ ATPase pump

(B) dobutamine – inhibits troponin I

(C) amrinone – inhibits troponin I

(D) dopamine – inhibits troponin I

(E) isoproterenol – inhibits 1 and 2 receptors

30. The rapid heart rate sometimes seen after nitroglycerin administration is best explained by

(A) a direct positive chronotropic effect on the myocardium

(B) reflex sympathetic discharge due to a fall in systemic blood pressure

(C) the ability of nitroglycerin to release norepinephrine from sympathetic nerve endings

(D) a decrease in intracranial pressure

31. The effectiveness of digitalis in the treatment of atrial flutter is primarily due to its ability to

(A) slow the rate of firing of the S-A node

(B) exert an atropine-like effect on the A-V node

(C) slow conduction through the A-V node

(D) decrease the refractory period through the A-V node

(E) decrease the rate of conduction through atrial muscle

32. When digitalis therapy is initiated, serious cardiac arrhythmias may be caused by a deficiency of

(A) K+ (B) Mg++

(C) All of the above (D) None of the above

33. The cardiac glycosides are used in the treatment of congestive heart failure and atrial fibrillation. Given the differences between the cardiac glycosides in their length of action and organs of major excretion, the correct statement concerning the use of digitoxin is:

(A) gastrointestinal absorption of digitoxin is incomplete and highly variable within patients

(B) digitoxin is excreted primarily unchanged in the kidney with a half life of about 24 hours

(C) digitoxin is highly protein bound in the serum

(D) digitoxin has a much higher incidence of toxicity in patients with renal disease

(E) digitoxin is only available as an oral preparation

34. Digitalis toxicity manifested by premature ventricular contractions maybe treated with all of the following EXCEPT:

(A) lidocaine

(B) digitalis-specific immune FAB antibody

(C) phenytoin

(D) quinidine

(E) all are correct

35. The correct statement regarding digitalis is

(A) in normal individuals, digitalis increases cardiac output

(B) in normal individuals, digitalis increases myocardial oxygen consumption

(C) in normal individuals, digitalis reduced total peripheral resistance in response to enhanced myocardial contractility

(D) in normal individuals, digitalis depresses myocardial contractility

(E) in normal individuals, digitalis increases heart rate

36. A routine electrocardiogram reveals a borderline delay in PR interval, sagging left ventricular ST segments and a shortened RT interval. The most likely explanation would be

(A) digitalis effect

(B) acute sub-endocardial ischemia

(C) hypokalemia

(D) hypocalcemia

(E) myxedema

37. An uncommon cardiac manifestation of digitalis toxicity is

(A) premature ventricular contractions

(B) second and third degree heart block

(C) atrio-ventricular junctional escape beats

(D) atrial fibrillation with rapid ventricular response

(E) all are correct

38. The maintenance dose of digoxin is primarily dependent upon

(A) renal function

(B) sex, hepatic function and protein level

(C) pulmonary function

(D) the loading dose and the type of diuretic being used

(E) level of serum potassium

39. Thiocyanate toxicity is a potential adverse effect associated with
A. amrinone, B. nitroglycerin, C. milrinone, D. Nitroprusside

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

40. A 42-year-old white male with rheumatic mitral insufficiency is seen with symptoms and findings of initial left ventricular failure. You give him digitalis and recall that all of the following are pharmacologic effects of digitalis EXCEPT

(A) decreases conduction velocity in the A-V node

(B) increases the effects of normal vagal activity of the heart

(C) shortens the effective refractory period of the Purkinje fibers

(D) weakens myocardial contractility

(E) prolongs the functional refractory period of the A-V node

41. Orthostatic hypotension is most likely to occur following the use of

(A) phenylephrine (B) reserpine

(C) amyl nitrite (D) metaraminol

(E) tetrahydrozoline

42. The chemical configuration of a molecule may determine its degree of absorption, its distribution, and its route of metabolism. Structurally, the digitalis glycosides resemble

(A) catecholamines (B) steroids

(C) salicylates (D) nitrofurantoin

(E) phenothiazines

43. All of the following are actions of nitrates in angina pectoris EXCEPT

(A) reflex increase in heart rate

(B) ventricular size decrease

(C) ejection fraction increased

(D) peripheral venous pooling–decrease in preload

(E) systolic blood pressure decrease

44. The sympathomimetic which may promote diuresis by a direct effect on the kidney is

(A) isoproterenol (B) dobutamine

(C) norepinephrine (D) dopamine

(E) epinephrine

45. Nitroglycerin administered sublingually reduces venous tone, causing pooling of blood in peripheral veins and lowers peripheral arterial resistance, resulting in a decline in blood pressure. Both end-diastolic and end-systolic dimensions of the left ventricle are reduced; therefore myocardial oxygen needs are decreased primarily by a reduction of

(A) blood pressure
(B) heart rate
(C) coronary vascular resistance
(D) intramyocardial tension
(E) sulfhydryl bonds

46. Digitalis must be used with caution in patients with acute myocardial infarction. Which of the following is true of digitalis use?

A. in normal hearts, it increases contractility and myocardial O2 consumption
B. it is recommended in uncomplicated myocardial infarction
C. in failing hearts, it decreases or leaves unchanged myocardial O2 consumption
D. in acute myocardial infarction, patients are less sensitive to the development of arrhythmias due to digitalis toxicity

(A) A only (B) A, B, C (C) A, C (D) B, D
(E) D only

47. Digitalis may slow the heart rate by

(A) blocking the activity of the carotid and aortic arch baroreceptors
(B) exerting an atropine-like effect on the A-V node
(C) stimulation of vagal center in the medulla to increase efferent firing
(D) increasing the rate of conduction through the A-V node
(E) none of the above

48. Compared to digitoxin, digoxin is or has

(A) more highly protein-bound
(B) more extensive enterohepatic circulation
(C) prolonged elimination half-life
(D) less completely absorbed orally
(E) more extensively hepatically cleared

49. The beneficial effects of digitalis are derived from its effect on myocardial contractility and on myocardial conduction and excitability. In therapeutic doses, digitalis

(A) slows the atrial rate in atrial fibrillation
(B) enhances atrioventricular conduction
(C) slows the atrial rate in sinus tachycardias
(D) slows the ventricular rate in atrial fibrillation
(E) decreases ventricular automaticity

50. Digitalis-induced emesis is

(A) only seen when digoxin is given orally

(B) of no true clinical importance

(C) due to stimulation of the chemoreceptor trigger zone

(D) related to Na+ K+ ATPase inhibition within the GI tract

(E) commonly seen with rapid parenteral administration

51. Digitalis has a beneficial effect on the failing myocardium via its action to increase the availability of calcium to the contractile machinery. As with many drugs, digitalis has also been overused. The correct statement concerning the use of digitalis in the ischemic and non-ischemic myocardium is

(A) there is a net increase in oxygen consumption in the non-failing myocardium

(B) there is a net increase in oxygen consumption in the failing dilated myocardium

(C) digitalis has proven value in prophylaxis for diastolic dysfunction

(D) digitalis causes vasoconstriction in the normal heart secondary to enhanced sympathetic outflow and blocking the Na+-K+ ATPase in smooth muscle

(E) digitalis causes an increase in heart rate in the normal heart

52. Properties of the class IA antiarrhythmics include

A. reduce automaticity of his-Purkinje fibers

B. decrease the rate of rise and amplitude of phase 0 depolarization

C. prolong P-R and Q-T intervals

D. facilitate inward sodium conductance during rapid depolarization

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

53. Which of the following antiarrhythmics may worsen angina symptoms by increasing myocardial oxygen requirements?

A. lidocaine B. verapamil

C. propranolol D. disopyramide

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

54. Cinchonism is a dose-related adverse reaction associated with which of the following antiarrhythmics?

A. tocainide B. procainamide C. disopyramide D. quinidine

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

55. Addition of propranolol to the drug regimen of a patient receiving lidocaine for premature ventricular contractions after a myocardial infarction results in

A. increased likelihood of breakthrough PVCs

B. displacement of protein-bound lidocaine

C. reduced renal clearance of lidocaine

D. increased likelihood of lidocaine toxicity

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

56. Electrophysiologic properties possessed by lidocaine include

A. reduction of effective refractory period in normal his-Purkinje fibers

B. prolonged effective refractory period in ischemic his-Purkinje fibers

C. shortened Q-T interval

D. prolonged P-R interval

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

57. Which of the following are classified as IB antiarrhythmics?

A. lidocaine B. phenytoin C. tocainide D. mexiletine

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

58. In treating supraventricular arrhythmias, which of the following reduces ventricular response primarily by increasing the effective refractory period of the A-V node?

A. propranolol B. digoxin C. verapamil D. tocainide

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

59. Potential side effects associated with amiodarone therapy include

A. pneumonitis B. pseudocyanosis C. photosensitivity D. parotiditis

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

60. Class IC antiarrhythmics possess which of the following electrophysiologic properties?

A. markedly prolong repolarization

B. markedly depress phase 0 depolarization

C. inhibit calcium entry during plateau portion of action potential

D. inhibit sodium entry during phase 0 depolarization

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

61. Adverse effects associated with disopyramide therapy include

A. urinary retention B. constipation

C. blurred vision D. lupus syndrome

(A) A, B, C (B) A, C (C) B, D (D) D only

(E) All are correct

62. Antiarrhythmic drugs can be separated into four groups, types I to IV. All of the following are type I antiarrhythmic drugs EXCEPT

(A) quinidine (B) lidocaine (C) procainamide (D) phenytoin

(E) propranolol

63. Quinidine toxicity includes all of the following EXCEPT

(A) thrombocytopenia (B) diarrhoea

(C) cinchonism (D) ventricular fibrillation

(E) hypertension

64. Of the following antiarrhythmic agents, the one which most closely resembles procainamide with respect to electrophysiologic effects and mechanism of action is

(A) quinidine (B) lidocaine (C) phenytoin (D) propranolol

(E) bretylium

65. Bronchiolar constriction is a rare but potentially dangerous side effect of

(A) quinidine (B) lidocaine (C) procainamide (D) phenytoin

(E) propranolol

66. The effect of different antiarrhythmic agents is best understood by knowing their predominant actions on cardiac fibers. All of the following general statements are true EXCEPT

(A) quinidine slows the rate of depolarization of cardiac action potentials and increases the refractory period

(B) lidocaine and phenytoin are class 1 B antiarrhythmic

(C) beta-receptor blocking drugs act by reducing the slope of the pacemaker potential

(D) procainamide acts as a specific calcium antagonist

(E) bretylium prolongs the action potential and so prolongs the absolute refractory period

67. In the pharmacologic treatment of cardiovascular disorders, quinidine has all of the following effects EXCEPT

(A) prolongation of the effective refractory period

(B) slows conduction velocity

(C) reduces spontaneous frequency of discharge of ectopic pacemaker

(D) has a positive chronotropic effect

(E) produces peripheral vasodilation in large doses

68. Which of the following medications is contraindicated in a patient with untreated complete heart block?

(A) atropine (B) prednisone (C) quinidine (D) isoproterenol

(E) hydrochlorothiazide

69. All of the following are common side effects of quinidine administration EXCEPT

(A) diarrhoea

(B) nausea and vomiting

(C) dry mouth

(D) tinnitus

(E) headache

70. 24 hours after an acute myocardial infarction, a 46-year-old male is being treated with a continuous intravenous drip of an antiarrhythmic drug to suppress frequent multifocal premature ventricular contractions. He develops generalized seizure activity. The seizure activity can be most readily explained by

(A) ventricular tachycardia

(B) systemic embolization

(C) systemic hypotension

(D) lidocaine toxicity

(E) ventricular asystole

71. TRUE statements concerning Vaughan-Williams's Class III antiarrhythmic drugs include all EXCEPT

(A) encainide, flecainide, and propafenone are in this class

(B) bretylium, amiodarone, and sotalol are in this class

(C) possess diverse pharmacologic effects but share the capacity to prolong action potential duration and refractoriness in Purkinje fibers

(D) block outflow of potassium during cell repolarization

(E) do not alter phase 0 depolarization or resting membrane potential

72. Correct statements concerning propafenone include all EXCEPT

(A) class IC antiarrhythmic

(B) slows actions potential conduction by blocking sodium channels

(C) possesses weak beta blocking activity

(D) class III antiarrhythmic

(E) increases duration of QRS complex

73. Correct statements concerning sotalol include all EXCEPT

(A) prolongs action potential duration and effective refractory period by blocking sodium channels.

(B) prolongs cell repolarization by blocking potassium channels.

(C) produces bradycardia

(D) prolongs Q-T interval

(E) increases effective refractory period

74. FALSE statement concerning use of calcium channel blockers as antiarrhythmics

(A) slows inward calcium current thereby decreasing the rate of spontaneous phase 4 depolarization in Purkinje fibers

(B) slows conduction velocity through the atrio-ventricular node and increases functional refractory period

(C) useful for slowing ventricular rate in atrial fibrillation

(D) hypotension may be a limiting side effect

(E) verapamil, diltiazem, and nifedipine all exert equally effective antiarrhythmic actions

75. CORRECT statement concerning the antiarrhythmic drug adenosine

(A) undergoes extensive hepatic metabolism

(B) produces coronary vasoconstriction

(C) causes frequent but transient post-conversion arrhythmias

(D) increases sinus node rate

(E) increases atrio-ventricular conduction

76. True statement concerning adenosine include all EXCEPT

(A) administered sublingually

(B) negative chronotrope

(C) negative dromotrope

(D) negative inotrope

(E) may precipitate bronchospasm

77. FALSE statement concerning adenosine

(A) half-life of 1 – 10 seconds

(B) higher doses necessary in patients taking theophylline

(C) chest pain and shortness of breath are common but short-lived side effects

(D) indicated for treating paroxysmal supraventricular tachycardia

(E) less effective than verapamil for treating paroxysmal supraventricular tachycardia

78. Correct statements about epinephrine administration for ventricular fibrillation include all EXCEPT

(A) 1 mg IV push every 3 – 5 minutes

(B) 0.1 mg IV push every 3 – 5 minutes

(C) 0.1 mg/kg IV push every 3 – 5 minutes

(D) 1 mg IV push followed by 3 mg IV push followed by 5 mg IV push 3 minutes apart

(E) 2.5 mg diluted to a total volume of 10 ml in saline solution via an endotracheal tube when no IV access is available

79. Which congenital heart defect causes a right to left shunt?

(A) Atrial septal defect

(B) Ventricular septal defect

(C) Truncus Arteriosus

(D) Coartation of the aorta

80. A 2-year-old male is rushed in by his parents after being found unconscious near open bottles of his grandfather' s medications. The airway is secure, and successful bag-valve ventilations are started. He is pulseless and unresponsive. Intravenous access is being obtained. The cardiac monitor shows a wide complex tachycardia at a rate of 260. What is the next step in management?

(A) Shock the patient with 200 J
(B) Shock the patient with 0.5 J/kg.
(C) Shock the patient with 2 J/kg
(D) Administer epinephrine 0.01 mg/kg IV

81. Echocardiographic evidence of tamponade includes which of the following?

(A) Pericardial effusion >1 cm in largest diameter
(B) Pericardial effusion with left ventricular collapse
(C) Pericardial effusion with right ventricular collapse
(D) Pericardial fluid collection

82. Cyanosis in the newborn may be caused by which of the following

(A) Transposition of the great arteries
(B) VSD
(C) Hyperbilirubinaemia
(D) Coarctation of the aorta
(E) Eisenmenger syndrome

83. A 1-year-old infant is known to have heart disease and is noted to be cyanosed. Which of the following is the most likely diagnosis?

(A) Atrial septal defect
(B) Coarctation of the aorta
(C) Patent Ductus Arteriosus
(D) Tricuspid atresia
(E) Ventricular septal defect

84. An uncomplicated VSD in a 5-year-old boy may be associated with which one of the following?

(A) A collapsing pulse
(B) Wide and fixed splitting of the second heart sound
(C) Clubbing of the fingers
(D) A pansystolic murmur of grade 4/6 in intensity
(E) Splenomegaly

85. A 14-year-old boy presents with hypertension. Which of the following statements concerning hypertension in the young is true?

(A) Sodium nitroprusside is useful for the long-term treatment of severe cases.
(B) Headache is the usual presenting feature.
(C) It is defined as systolic blood pressure above the 99th centile for age.
(D) Abnormalities are frequently seen on DMSA scan.
(E) Aortic coarctation is the commonest secondary cause.

86. A four year old child is found to have the classical murmur of a patent ductus. He is underweight for age but otherwise well. Which of the following would you recommend for this patient?

(A) Recommend early operative closure

(B) Review the child constantly, expecting spontaneous closure within the next five years

(C) Recommend prophylactic penicillin until operation is performed

(D) Delay operation until the child has reached its expected weight for age

(E) Explain to the parents that this is of little significance and can be ignored

87. Select which of the following is correct in relation to congenital heart disease.

(A) The murmur of a ventricular septal defect is likely to be loud in the first day of life.

(B) In Down's syndrome with an endocardial cushion defect irreversible pulmonary hypertension occurs earlier than in children with normal chromosomes.

(C) Atrial septal defects, in contrast with ventricular septal defects, never close spontaneously.

(D) Transposition of the great vessels is the most common congenital cyanotic heart disease.

(E) Failure to thrive is often found associated with Fallot's tetralogy at about 3 months of age.

88. A 4 month old boy is brought in dead to hospital. He had had a cold for 3 days, with crusty nose and mild fever. He went to bed at 7 pm as usual. Mother checked him at 11 pm before going to bed. In the morning she found him stiff and cold. He was brought to ER by ambulance, but resuscitation was unsuccessful. Mother is single 19 years and smokes 20/d. He was born at 39/40 weighing 3.25 kg, and there were no neonatal problems. He had been growing along the 50th centile for height and weight. What is the most likely diagnosis?

(A) Acute life-threatening event (B) Cardiac dysrhythmias

(C) Seizures (D) Sudden infant death syndrome

(E) Acute myocarditis

89. Which of the following circulatory changes occur at birth?

A. A rise in right atrial pressure

B. Flap closure of the foramen ovale

C. Anatomical closure of the ductus arteriosus

D. Functional closure of the ductus venosus

E. A 20-fold increase in lung blood flow

(A) A, C (B) B, D (C) C, E (D) E, A

90. A 2 day old baby girl with congenital heart disease needed emergency surgery to improve (increase) her pulmonary circulation. What surgical procedure do you think she had?

(A) patch closure of an atrial septal defect

(B) suture closure of a patent ductus arteriosus

(C) systemic to pulmonary artery shunt

(D) ligation of large collateral arteries

(E) patch closure of a ventricular septal defect

91. Which of the following is false about Dopamine?

(A) they increases cardiac output

(B) they in high doses causes peripheral vasodilatation

(C) they increases renal blood flow

(D) they increases ventricular excitability

(E) they increases splanchnic blood flow

92. Alpha-adrenoceptor blocking agents

(A) increase blood flow in normal skin and muscle

(B) cause drowsiness

(C) clinically useful drugs are competitive antagonists

(D) have only alpha 1- blocking activity

(E) are chronotropic agents

93. The oxygen carrying capacity of the blood is

(A) the maximum quantity of oxygen that will combine with 100 ml of whole blood

(B) the ratio between oxygen uptake and oxygen usage

(C) independent of the haemoglobin concentration

(D) the oxygen physically dissolved in blood

(E) normally of the order of 15 ml per 100 ml whole blood

94. The following are isotonic with plasma

(A) 1.2% sodium bicarbonate

(B) 5% dextrose

(C) 0.9 molar NaCl

(D) Hartmann's solution (Ringer-Lactate)

(E) All the above

95. Heart rate is slowed by

(A) amphetamine (B) atropine (C) propranalol (D) dobutamine

(E) nifedipine

96. In pulse oximetry

(A) the theoretical basis is Stefan's law

(B) calibration is against known *in vitro* standards

(C) carboxyhaemoglobin does not affect readings

(D) accuracy at readings above 90% saturation is to within 0.1%

(E) None of the above

97. Which one of the following are not important in physiological limitation of blood clotting?

(A) removal of activated clotting factors by the liver

(B) prostacyclin

(C) protein C

(D) a factor released from the endothelial cells

(E) None of the above

98. In the electrocardiogram at a heart rate of 80 per minute

(A) the PR interval should be less than 0.2 s and greater than 0.12 s

(B) the QRS complex should last less than 0.02 s

(C) the T wave is normally greater than 1 mV

(D) there will be an interval of 0.75 s between the end of one complex and the beginning of the next

(E) none of the above

99. Which of the following is false about Atropine ?

(A) has no effect on acetylcholine production or destruction

(B) dilates cutaneous blood vessels

(C) is a parasympathetic depressant

(D) stimulates the respiratory centre

(E) all of the above

100. Who is the father of Cardiovascular Medicine?

(A) Ronald Ross (B) Weiszmann

(C) William Harvey (D) Darwin

(E) None of the above
