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MCC-001

POST GRADUATE DIPLOMA IN CLINICAL CARDIOLOGY (PGDCC)

Term-End Examination

June, 2010

MCC-001 : FUNDAMENTALS OF CARDIOVASCULAR SYSTEM - I

Time : 2 hours *Maximum Marks : 60*

Note :

(i) *There will be multiple choice type of questions in this examination which are to be answered in* ***OMR Answer Sheets.***

(ii) *All questions are* ***compulsory.***

(iii) *Each question will have four options and only* ***one*** *of them is correct. Answers have to marked in figures in the appropriate rectangular boxes corresponding to what is the correct answer and then blacken the circle for the same number in that column by using HB or lead pencil and not by ball pen* ***in OMR Answer Sheets.***

(iv) *If any candidate marks more than one option, it will be taken as the wrong answer and no marks will be awarded for this.*

(v) *Erase completely any error or unintended marks.*

(vi) *There will be* ***90*** *questions in this paper and each question carries equal marks.*

(vii) *There will be no negative marking for wrong answers.*

(viii) *No candidate shall leave the examination hall at least for* ***one*** *hour after the commencement of the examination.*

*Only **one** of the multiple choices is correct. Please choose the most appropriate answer.*

1. Lead V_3 is positioned at :
   (1) Left sternal margin 4th intercostals space
   (2) Midway between V2 to V4
   (3) Left mid clavicular line fifth intercostals space
   (4) Left anterior axillary line

2. Normal P wave duration is :
   (1) upto 100 ms
   (2) upto 150 ms
   (3) upto 200 ms
   (4) upto 300 ms

3. PR segment is referred to :
   (1) Beginning of P to beginning of QRS
   (2) Beginning of Q to end of QRS
   (3) Beginning with the end of P wave to ending with the onset of QRS
   (4) Beginning with the end of P wave to ending with the end of QRS

4. About the U wave in ECG, all are true except :
   (1) The amplitude is usually less than 0.1 mV
   (2) Has the opposite polarity as the preceding T wave
   (3) May be caused by the repolarization of the Purkinje fibres
   (4) The U wave is usually the largest at the mid precordial leads

5. The normal value of corrected QT interval is usually :
   (1) Less than 340 ms
   (2) Less than 440 ms
   (3) Less than 540 ms
   (4) Less than 640 ms

6. Prolonged P (>120 ms) in lead II suggests :
   (1) Right atrial enlargement
   (2) Right ventricular enlargement
   (3) Left ventricular enlargement
   (4) Left atrial enlargement

7. Left atrial enlargement is suggested by all of the following except :

(1) Rightward shift of mean P wave axis

(2) Increased depth and duration of terminal negative portion of V1

(3) Ratio between duration of P wave and duration of PR segment in lead II is > 1.6

(4) Prominent notching of P wave in lead II with interval between the peaks more than 40 ms

8. LBBB is diagnosed when all of the following are present except :

(1) Broad notched R wave in lateral precordial leads (V5, V6) and usually leads I and a VL.

(2) Absent septal q in left sided leads

(3) Small or absent initial r wave in right precordial leads (V1, V2) followed by deep S wave

(4) QRS duration ≤120 ms

9. Tall R in V1 can be caused by all except :

(1) Posterior MI

(2) Right sided accessory pathway with preexcitation

(3) Right ventricular hypertrophy

(4) Duchenne muscular dystrophy

10. ST elevation in lead II exceeding that of lead III with ST depression in V1 to V3 indicates MI in which territory ?

(1) LAD territory

(2) RCA territory in a non dominant RCA

(3) Diagonal territory

(4) Left circumflex territory

11. ST elevation in V1 to V3 indicates :

(1) Anteroseptal MI (2) Lateral MI

(3) Inferior MI (4) Posterior MI

12. All the following ECG criteria suggest RV hypotrophy except :

(1) R in V1 $\geq$ 0.7 mV

(2) QRS axis + 120 degree

(3) Height of P more in II > 3 mm

(4) Negative component of P in V1 > 2 mm

13. All the following lead to ST segment elevation except :

(1) Hyper acute myocardial infarction

(2) Pericarditis

(3) LV aneurysm

(4) LV Hypertrophy with strain pattern

14. Normal sequence of evolution in ECG in a case of myocardial infarction is :

(1) Tall peaked T wave, ST elevation, Development of Q, ST returning to base line

(2) ST elevation, Tall peaked T wave, ST returning to base line, Development of Q

(3) Tall peaked T wave, Development of Q, ST elevation, ST returning to base line

(4) ST elevation, Development of Q, Tall Peaked T wave, ST returning to base line

15. ECG changes due to hyperkalemia all except :

(1) Tall peaked T wave

(2) Long QT interval

(3) Bundle branch block pattern

(4) Decreased P wave amplitude and PR prolongation

16. All of the following indicate trifascicular block except :

(1) RBBB + LAHB + I° AV block

(2) RBBB + LPHB + I° AV block

(3) Alternate LBBB and RBBB

(4) LBBB

17. Which of the following if present may indicate the wide QRS tachycardia may not be ventricular tachycardia ?

(1) History of myocardial infarction

(2) Fusion and capture beats

(3) AV dissociation

(4) rsR′ in V1 during VT

18. Age predicted maximal heart rate is calculated as :

(1) 240 - age of patient (2) 220 - age of patient

(3) 200 - age of patient (4) 180 - age of patient

19. 1 metabolic equivalent is equal to :

(1) 3.5 ml O_2/kg/min (2) 4.5 ml O_2/kg/min

(3) 5.5 ml O_2/kg/min (4) 6.5 ml O_2/kg/min

20. Exercise parameters associated with adverse prognosis may be all except :

(1) Duration of symptom limiting exercise < 5 METs

(2) Angina pectoris at low exercise workload

(3) Failure to increase systolic BP more than 120 mm Hg, or sustain decrease of BP by more than 10 mm Hg during exercise

(4) T inversion in one lead during exercise with out associated with ST changes

21. Absolute contraindication to exercise testing is :

(1) Unstable angina study (2) Exertional breathlessness

(3) Moderate aortic stenosis (4) Advanced atrioventricular block

22. Which is the best way to evaluate inducible ischemia in the presence of baseline ST depression ?

(1) Stress perfusion study (2) Exercise ECG study

(3) Coronary angiography (4) PET Scan

23. Wide QRS tachycardia is referred to :

(1) Tachycardia with QRS width of more than 140 ms.

(2) Tachycardia with QRS width of more than 120 ms.

(3) Tachycardia with QRS width of more than 130 ms.

(4) Tachycardia with QRS width of more than 100 ms.

24. Which following criteria strongly favours ventricular tachycardia ?

(1) QRS criteria identical to that during sinus rhythm

(2) Slowing or termination with vagal maneuver

(3) Initiation with premature P wave

(4) AV dissociation

25. Short RP tachycardia are all except :

(1) Typical AV nodal reentrant tachycardia

(2) Orthodromic atrioventricular reciprocating tachycardia

(3) Ectopic atrial tachycardia

(4) Sinus tachycardia with long PR interval

26. Which of the following drugs acts on both AV node and accessory pathway ?

(1) Betablocker (2) Ca channel blocker

(3) Adenosine (4) Amiodarone

27. Type I, 2nd degree AV block refers to :

(1) Progressive PR prolongation followed by a nonconducted P wave

(2) Long PR interval

(3) Long PR interval with LBBB

(4) Alternating LBBB with RBBB

28. According to Vaughan William's classification for anti arrhythmic drugs Mexiletine is classified as :

(1) Class IA (2) Class IB (3) Class IC (4) Class III

29. Electrophysiology study and radio frequency ablation is a standard mode of therapy in all of the following patients except :

(1) AV nodal reentrant tachycardia

(2) Accessory pathway mediated reciprocating tachycardia

(3) Atrial flutter

(4) Ventricular fibrillation

30. In permanent atrial fibrillation with complete heart block which pacemaker mode is the treatment of choice ?

(1) VVIR (2) DDD (3) DDDR (4) AAIR

31. Diagonal artery is a branch of :

(1) Left descending anterior artery

(2) Left circumflex artery

(3) Right coronary artery

(4) Posterior descending artery

32. Coronary sinus drains to :

(1) LA (2) RA (3) LV (4) RV

33. Vein of Marshall is a remnant of :

(1) Vitelline vein (2) Right Umbilical vein

(3) Right anterior cardinal vein (4) Left superior venacava

34. Which of the following is a cyanotic heart disease :

(1) PAPVC (2) Pulmonary stenosis

(3) Tricuspid atresia (4) ASD

35. Which of the following disorders may lead to pulse asymmetry in both the upper limb :

(1) Aortic stenosis (2) PDA

(3) Coarctation of aorta (4) Right aortic arch

36. Ostium secundum type ASD is due to :

(1) Coelasce of perforations at the upper portion of the septum primum

(2) Opening formed by the free edge of the secundum primum towards endocardial cushion

(3) Perforation in the septum secundum

(4) Enlargement of ostium primum

37. Great cardiac vein drains to :

(1) RA (2) RV (3) LA (4) Coronary sinus

38. Large ASD with left to right shunt leads to dilatation of :

(1) LA (2) LV (3) Coronary sinus (4) RV

39. Which is not a part of ventricular systole ?

(1) Rapid filling phase (2) Ejection phase

(3) Isovolumetric contraction (4) First heart sound

40. Ventricular repolarization is represented in ECG by :

(1) QT interval (2) PR segment

(3) QRS (4) TP segment

41. "a" wave in the jugular venous pressure is due to :

(1) Ventricular contraction (2) Atrial contraction

(3) Ventricular relaxation (4) Atrial relaxation

42. Severe Tricuspid regurgitation leads to :

(1) Prominent VY wave in Jugular vein

(2) Prominent A wave in jugular vein

(3) Prominent C wave in jugular vein

(4) Prominent X descent in jugular vein

43. Left ventricle is derived from :

(1) Bulbus cordis (2) Sinus venosus

(3) Primitive ventricle (4) Cardinal vein

44. Which of the following leads to right to left cardiac shunting ?

(1) Partial anomalous pulmonary vein connection

(2) VSD with normal pulmonary artery pressure

(3) Tetralogy of fallot

(4) PDA with normal pulmonary artery pressure

45. Atrioventricular sulcus :

(1) Divides left and right atria

(2) Divides atria and primitive ventricle

(3) Divides Primitive ventricle and Bulbus cordis

(4) Divides Bulbous cordis and Truncus arteriosus

46. Sarcomere is the distance between :

(1) Two Z lines (2) Two M lines

(3) Two H lines (4) Two A lines

47. Calcium uptake into sarcoplasmic reticulum is mediated by :

(1) Sarcoendoplasmic reticulum Ca ATPase (SERCA)

(2) Ryanodine receptors

(3) T tubules

(4) Sodium-Calcium exchange pump

48. Which of the following drugs does not increase the action potential duration ?

(1) Procainide (2) Ajmaline (3) Mexiletene (4) Amiodarone

49. Which of the following drugs has a very short half life ?

(1) Amiodarone (2) Metoprolol (3) Adenosine (4) Verapamil

50. Delayed after depolarization may be caused by :

(1) Quinidine therapy (2) Digitalis therapy

(3) Amiodarone therapy (4) Sotalol therapy

51. The correct sequence of cardiac conduction system from beginning is :

(1) SA node, AV node, Purkinje system, His bundle

(2) SA node, AV node, His bundle, Purkinje system

(3) SA node, Purkinje system, AV node, His bundle

(4) SA node, Purkinje system, His bundle, AV node

52. Pulmonary oligemia is a feature of :

(1) ASD (2) VSD (3) PDA (4) TOF

53. Prominent Main pulmonary artery is seen in all except :

(1) Idiopathic dilatation of pulmonary artery

(2) Pulmonary valvular stenosis

(3) Patent ductus arteriosus with left to right shunt

(4) Tetralogy of fallot

54. S4 is caused by :

(1) Atrial contraction (2) Ventricular contraction

(3) Closure of Mitral value (4) Opening of Mitral valve

55. The common electrocardiographic changes of pulmonary embolism are all except :

(1) Sinus tachycardia

(2) Incomplete right bundle branch block

(3) S1Q3T3 in ECG

(4) Left bundle branch block

56. Signs of pulmonary embolism all except :

(1) Tachypnea

(2) Soft P2

(3) Systolic murmur due to Tricuspid regurgitation

(4) Fast heart rate

57. T inversion is seen in all of the following except :

(1) Juvenile T wave pattern

(2) Myocardial ischemia

(3) Post tachycardia T wave pattern

(4) Hyperacute anterior Myocardial infarction

58. Causes of low voltage QRS complex are all except :

(1) Extensive myocardial infarction

(2) Cardiac tamponade

(3) Normal variant

(4) Ventricular hypertrophy

59. Common causes of QRS alternans in ECG all except :

(1) Cardiac tamponade (2) Bypass tract mediated SVT

(3) Large pericardial effusion (4) Slow ventricular tachycardia

60. Features of hyperkalemia are all except :

(1) Tall T wave (2) Prolonged QT

(3) Sinus bradycardia (4) Highgrade AV block

61. Lead II in ECG refers to :

(1) Potential difference between left arm and right arm

(2) Potential difference between right arm and left foot

(3) Potential difference between left foot and left arm

(4) Potential difference between right foot and left arm

62. Precordial lead V7 represents :

(1) Left mid axillary line in the same horizontal plane as V4

(2) Left anterior axillary line in the same horizontal plane as V4

(3) Left posterior axillary line in the same horizontal plane as V4

(4) Left posterior scapular line in the same horizontal plane as V4

63. Duration of Normal PR interval is :

(1) Less than 120 ms (2) Less than 200 ms

(3) Less than 250 ms (4) Less than 300 ms

64. RBBB refers to :

(1) rS in V1 (2) QS in V1 (3) qR in V6 (4) rsR′ in V1

65. Normal mean QRS axis in adult is :

(1) 0 to 90 degree (2) 0 to 180 degree

(3) −30 to 90 degree (4) −30 to 180 degree

66. Initial activation interventricular septum in normal persons results in :

(1) Initial positive wave in Lead I (2) Large Q in aVR

(3) Initial r in V1 (4) Large Q in Lead III

67. Indication for terminating the exercise in all except :

(1) Moderate to severe angina

(2) Sustained ventricular tachycardia

(3) ST elevation by more than 1 mm in leads with out Q wave

(4) BP rising to 180/100 mm Hg

68. Bruce protocol first stage is :

(1) 1.7 miles per hour at 10 degree inclination

(2) 1.7 miles per hour at 12 degree inclination

(3) 2.5 miles per hour at 10 degree inclination

(4) 2.5 miles per hour at 12 degree inclination

69. The exercise protocol recommended for patients with compensated congestive heart failure is :

(1) Bruce protocol
(2) Bicycle ergometry
(3) Naughton protocol
(4) Cornell protocol

70. Abnormal ST depression during exercise protocol is :

(1) 1 mm or more J point depression with relatively flat ST depressed by 0.10 mV or more 80 ms after J point

(2) 2 mm or more J point depression with relatively flat ST depressed by 0.01 mV or more 80 ms after J point

(3) 1 mm or more J point depression with relatively flat ST depressed by 0.01 mV or more 40 ms after J point

(4) 1 mm or more J point depression with relatively flat ST depressed by 0.01 mV or more 120 ms after J point

71. Indication for pacemaker implantation is all except :

(1) Symptomatic sick sinus syndrome

(2) First degree AV block even without symptoms

(3) Persistent postoperative complete heart block even without symptoms

(4) Alternating bundle branch block with history of syncope

72. Torsades de pointes may occur with all of the following conditions except :

(1) Hypokalemia
(2) Complete heart block
(3) Erythromycin therapy
(4) Amoxicillin therapy

73. True negative in a stress test indicates :

(1) Abnormal test results with individuals with disease

(2) Abnormal test result in individuals without disease

(3) Normal test result in individual without disease

(4) Normal test result in individual with disease

74. The target heart rate during tread mill test for a 60 year old male would be :

(1) 150 (2) 160 (3) 170 (4) 180

75. Which of the following carries more significance during a stress test for diagnosing coronary artery disease ?

(1) Rapid up sloping ST depression

(2) Slow up sloping ST depression

(3) T inversion

(4) Down sloping ST depression

76. Ventricular triplet refers to :

(1) Three consecutive ventricular ectopic beats

(2) One ventricular ectopic beat coming after every two sinus beats

(3) One ventricular ectopic beat after every three sinus beats

(4) One ventricular ectopic beat after every four sinus beats

77. Atrial flutter rate ranges from :

(1) 150 to 250 per minute (2) 250 to 350 per minute

(3) 350 to 450 per minute (4) 450 to 550 per minute

78. Ventricular preexcitation is characterized by all except :

(1) Presence of delta wave (initial slurring of QRS)

(2) Prolonged QRS duration (> 100 ms)

(3) Secondary ST-T changes due to altered ventricular activation sequence

(4) Long PR interval (> 200 ms)

79. IV Drug of choice to terminate SVT is :

(1) IV amiodarone (2) IV adenosine

(3) IV xylocaine (4) IV ibutilide

80. All of the following ECG changes may be seen in isolated mitral stenosis except :

(1) Prominent negative deflection of terminal portion of P in V1

(2) R in V1 more than 1.0 mV

(3) Right axis deviation

(4) SV1 + (RV5 or RV6) > 3.5 mV

81. All of the following open to right atrium except :

(1) SVC (2) IVC (3) Coronary sinus (4) Pulmonary vein

82. The moderator band is found in :

(1) Right ventricle (2) Left ventricle (3) Right atrium (4) Left atrium

83. Obtuse marginal artery arises from :

(1) Left anterior descending coronary artery

(2) Right coronary artery

(3) Left circumflex coronary artery

(4) Left internal mammary artery

84. Right coronary artery is dominant in :

(1) 75% cases (2) 85% cases (3) 95% cases (4) 100% cases

85. Right coronary artery is called dominant when ?

(1) It falls short of crux

(2) It gives rise to PDA but does not give rise to any postero lateral branches

(3) It gives rise to at least one postero lateral branch in addition to PDA

(4) It gives rise to a large RV branch

86. SA node is situated at :

(1) Right atrium at the lower end of crista

(2) Right atrium at the upper end of crista

(3) Left atrium near left upper pulmonary vein

(4) Right atrium near to coronary sinus ostium

87. All of the following veins drain to coronary sinus except :

(1) Great cardiac vein (2) Oblique vein of left atrium

(3) Middle cardiac vein (4) Venae cordis minimi

88. Y descent in atrial wave form is seen during :

(1) Ventricular diastole

(2) Ventricular systole

(3) Atrial systole

(4) Isometric ventricular contraction

89. Third heart sound is heard :

(1) During ejection phase of cardiac cycle

(2) During rapid filling phase of cardiac cycle

(3) During Isovolumetric contraction phase of cardiac cycle

(4) During Atrial systole phase of cardiac cycle

90. All of the following cardiac contractile proteins except :

(1) Actin (2) G protein (3) Myosin (4) Troponin