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MCC-001

POST GRADUATE DIPLOMA IN CLINICAL CARDIOLOGY (PGDCC)

Term-End Examination

01124

December, 2014

MCC-001 : FUNDAMENTALS OF CARDIOVASCULAR SYSTEMS – 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.*

1. A patient with myocardial infarction presented with syncope. ECG showed complete heart block. The coronary artery most likely to be involved is

(1) Left anterior descending

(2) Left circumflex

(3) Right coronary

(4) Obtuse marginal

2. A patient with inferior wall myocardial infarction had left circumflex occlusion in angiogram. Right coronary was normal. His posterior inter-ventricular branch arises from

(1) Right coronary

(2) Left circumflex

(3) Both (1) and (2)

(4) None of the above

3. A stab injury in the left lower sternal area is most likely to hit

(1) Right atrium

(2) Right ventricle

(3) Both (1) and (2)

(4) None of the above

4. A needle penetrating through the right atrium just above the septal cusp of the tricuspid valve will reach

(1) Left atrium

(2) Pulmonary trunk

(3) Right ventricle

(4) Left ventricle

5. The cusp experiencing forceful blood-flow on both its surfaces is

(1) Anterior cusp of aortic valve

(2) Posterior cusp of aortic valve

(3) Septal cusp of tricuspid valve

(4) Anterior cusp of mitral valve

6. In constrictive pericarditis the structure not constricted will be

(1) Ascending aorta

(2) Inferior vena cava

(3) Pulmonary trunk

(4) Right upper pulmonary vein

7. During inspiration all the events happen *except*

(1) Blood flow increases through Inferior vena cava

(2) Pulmonary valve takes more time to close

(3) Blood flow increases in Left Atrium

(4) Aortic valve closes early

8. An agent preventing dissociation of calcium in the sarcomere will cause all *except*

(1) Increased contraction

(2) Increased number of cross-bridges

(3) Increased relaxation

(4) None of the above

9. Increase in preload can produce all *except*

(1) Increase in cardiac oxygen consumption

(2) Decrease in sub-endocardial ischemia

(3) Increase in resistance to ejection

(4) None of the above

10. A patient with orthostatic hypotension can use all of the following maneuvres to increase venous return *except*

(1) Calf muscle exercise

(2) Lying down flat

(3) Intake of plenty of fluids

(4) All of the above

11. A patient with COPD with high pCO_2 and warm extremities will exhibit all the following *except*

(1) Stimulation of aortic and carotid chemoreceptors

(2) Stimulation of medullary centers

(3) Local vasoconstriction

(4) None of the above

12. In a patient with sepsis all can happen *except*

(1) Decreased venous return

(2) Arteriolar dilatation

(3) Increase in heart rate

(4) None of the above

13. In fetal life the blood is diverted from the pulmonary circulation to the systemic circulation by all *except*

(1) Septum primum

(2) Foramen ovale

(3) Ductus arteriosus

(4) None of the above

14. Abnormality of trunco-conal swelling is seen in

(1) Tetralogy of Fallot

(2) Transposition of great vessels

(3) Persistent Truncus Arteriosus

(4) All of the above

15. All are true about probe patency of foramen ovale *except*

(1) Foramen ovale is closed functionally

(2) There is trans-septal flow

(3) Seen in 25% of normal subjects

(4) None of the above

16. A patient with severe mitral regurgitation will demonstrate the following in chest X-ray *except*

(1) Gross cardiomegaly

(2) Extension of the cardiac shadow behind the barium filled esophagus

(3) Hoffman Rigler sign

(4) None of the above

17. An old lady who underwent recent hip replacement developed sudden severe dyspnea with RBBB in ECG. Her chest X-ray will show all of the above *except*

(1) Enlargement of the pulmonary artery

(2) Distal pulmonary oligemia

(3) Triangular pleural-based infiltrate

(4) Significant pleural effusion

18. A patient presenting with sudden severe chest pain with absent left upper limb pulses and normal ECG can show

(1) Westermark sign

(2) Ring sign

(3) Hampton hump

(4) Fleischner's sign

19. A patient with past history of rheumatic fever and mid-diastolic murmur can show

(1) Upper lobar pulmonary vein > 3 mm in first interspace

(2) Carinal angle < 90 degrees

(3) Both (1) and (2)

(4) None of the above

20. A patient with history of valve surgery showing the prosthesis just left to the spine has undergone

(1) Aortic valve replacement

(2) Pulmonary valve replacement

(3) Mitral valve replacement

(4) Tricuspid valve replacement

21. Kerley B lines suggest pulmonary venous hypertension of grade

(1) I

(2) II

(3) III

(4) None of the above

22. A patient with ascites, pedal edema, inspiratory distension of neck veins and loud S3 can show following features in X-ray *except*

(1) dense calcification in atrio-ventricular groove

(2) calcification best seen in A-P view

(3) calcification in arcs or oblique circles

(4) None of the above

23. A patient with a pulmonary artery systolic pressure of 100 mm of Hg will show in X-ray all *except*

(1) Right descending pulmonary artery > 16 mm

(2) Sharp pruning of peripheral vasculature

(3) Increased concavity of pulmonary conus

(4) None of the above

24. A patient with ASD will show the following features in X-ray *except*

(1) Visualization of pulmonary branches beyond inner 2/3rd of the lungs

(2) More dilatation of the upper lobar vessels

(3) 5 or more end on vessels in both lung fields

(4) 3 or more end on vessels in one lung field

25. All the following structures form the right border of heart in X-ray *except*

(1) right brachiocephalic vessels

(2) right atrial appendage

(3) superior vena cava

(4) inferior vena cava

26. A patient with cannon A wave in the JVP and palpitation may show all of the following in the ECG *except*

(1) extreme left axis

(2) double-peaked R in V1 with taller peak

(3) Dressler beat

(4) None of the above

27. A patient with significant ST-depression with normal coronary angiogram may have all of the following *except*

(1) ventricular hypertrophy

(2) hypokalemia

(3) mitral valve prolapse

(4) None of the above

28. Following are true about the ECG leads *except*

(1) leads I, II and III detect a change in electrical potential between two points

(2) leads aVR, aVL and aVF measure the electrical potential at one point with respect to null point

(3) precordial leads are bipolar

(4) None of the above

29. All of the following denotes normal axis in the ECG *except*

(1) both I and a VF +ve

(2) lead II +ve

(3) Both of the above

(4) None of the above

30. A patient with emphysema will show the following in the ECG *except*

(1) very small QRS in lead I

(2) P-pulmonale

(3) tall R in V6

(4) None of the above

31. Following are true about S1Q3T3 *except*

(1) found in < 20% of acute pulmonary embolism

(2) is a reflection of acute Cor pulmonale

(3) can be seen in pneumothorax

(4) None of the above

32. A 15yr old boy with fever, night sweat and cervical lymph node enlargement suddenly developed acute chest pain. His ECG can show all of the following *except*

(1) ST-elevation with upward concavity

(2) ST-elevation not corresponding to any arterial territory

(3) loss of R-wave progression

(4) None of the above

33. A patient with history of shortness of breath and mid-diastolic murmur will show in the ECG all *except*

(1) notched broad P-wave of 0.12 msecs in I and II

(2) Terminal portion of P in V1 = 0.04 mV

(3) P-wave axis of +15 degree

(4) None of the above

34. A male patient with hypertension may show in the ECG all of the following *except*

(1) S in V3 + R in aVL = 20 mm

(2) S in V1 + R in V6 = 38 mm

(3) R in I + S in III = 28 mm

(4) Left axis deviation

35. Tall peaked T-waves can occur in all *except*

(1) hyperkalemia

(2) acute myocardial infarction

(3) Both (1) and (2)

(4) None of the above

36. A patient with anterolateral wall infarction will show ST elevation in

(1) V1-V2

(2) V5-V6

(3) V3-V4

(4) I, aVL

37. The arrhythmia most characteristic of successful reperfusion is

(1) non-sustained VT

(2) accelerated ventricular rhythm

(3) accelerated junctional rhythm

(4) None of the above

38. A patient of mitral, stenosis presenting with cerebral stroke alongwith irregularly irregular pulse will show all of the following in the ECG *except*

(1) irregular ventricular rate

(2) fibrillatory wave

(3) saw-tooth waveform

(4) None of the above

39. A patient with irregularly irregular pulse can show all of the following arrhythmias *except*

(1) atrial fibrillation

(2) multifocal atrial tachycardia

(3) atrial flutter with varying block

(4) None of the above

40. A patient with LBBB will show all of the following in the ECG *except*

(1) QRS duration $\geq$ 0.12 secs

(2) terminal S in V1

(3) ST-T waves in the same direction as terminal QRS forces

(4) None of the above

41. A patient with all of the following cannot undergo stress testing *except*

(1) acute myocardial infarction on 7th day

(2) unstable angina with chest pain within 48 hrs

(3) acute myocarditis

(4) None of the above

42. All of the following indicate LAD occlusion proximal to the first diagonal in exercise stress test *except*

(1) ST elevation in V1

(2) decreased T-wave negativity in V1

(3) ST-depression in two of the three leads V1, V2, V3

(4) None of the above

43. Following are true about the predictive value of abnormal stress test *except*

(1) man > 45 yrs with 1 mm ST depression has 90% chance of CAD

(2) man > 45 yrs with 1.5 mm ST depression has 94 – 95% chance of CAD

(3) man > 45 yrs with 2 mm ST depression has 98% chance of CAD

(4) None of the above

44. Following types of ST-depression denote ischemia in exercise stress test *except*

(1) upsloping ST depression 1 mm below the baseline level of PQ junction at 80 msec after J-point

(2) ST depression at recovery

(3) ST depression of 1 mm when R is 10 mm

(4) None of the above

45. In a patient unable to perform treadmill Thallium Stress Test can be performed with

(1) adenosine

(2) dipyridamole

(3) Both (1) and (2)

(4) None of the above

46. Treadmill test with ventilatory gas analysis should be done in
(1) prior to cardiac transplant
(2) after acute myocardial infarction
(3) diagnosis of coronary artery disease
(4) None of the above

47. A treadmill test should be terminated when
(1) target heart rate is achieved
(2) patient is cold and clammy
(3) musculoskeletal pain is severe
(4) All of the above

48. ST elevation in leads without Q waves in treadmill test indicates
(1) very high grade proximal LAD stenosis
(2) high graft stenosis of a large RCA
(3) severe coronary spasm
(4) All of the above

49. All of the following can cause false positive ST changes during treadmill test *except*
(1) digitalis
(2) hypokalemia
(3) hyperventilation
(4) None of the above

50. Ominous PVCs are
(1) multifocal
(2) multiform
(3) repetitive
(4) All of the above

51. As compared to Thallium Scintigraphy, Technetium 99m Sestamibi Scan is
(1) more expensive
(2) takes shorter time to perform
(3) gives more information as regards to wall motion
(4) All of the above

52. Accelerated automaticity is responsible for

(1) sinus tachycardia

(2) atrial tachycardia

(3) Both (1) and (2)

(4) None of the above

53. Following are true about atrial fibrillation *except*

(1) when ventricular rate <100 bpm atrial fibrillation is termed as controlled

(2) fibrillatory waves vary in shape and size

(3) result from multiple areas of re-entry

(4) can originate from single ectopic focus

54. All are short RP tachycardias *except*

(1) AVNRT

(2) AVRT

(3) Both (1) and (2)

(4) None of the above

55. All are characteristic features of VT *except*

(1) capture beat

(2) fusion beat

(3) bizarre frontal plane QRS axis

(4) None of the above

56. A typical LBBB will show all except

(1) QRS duration $\geq$ 0.12 secs

(2) terminal S-wave in V1

(3) terminal R-wave in I, aVL and V6

(4) primary ST-T waves

57. All of the long QT syndromes are associated with normal hearing *except*

(1) Romano-Ward

(2) Jervell-Lange-Nielson

(3) Both (1) and (2)

(4) None of the above

58. All are true about ECG of myocardial infarction *except*

(1) T-wave inversion is caused by ischemia

(2) ST-elevation is caused by injury

(3) Q-wave is caused by infarct

(4) None of the above

59. All are early ECG changes in hyperkalemia *except*

(1) peaked T-waves

(2) absent P-waves

(3) shortened QT-interval

(4) None of the above

60. Right atrial hypertrophy in the ECG is indicated by all *except*

(1) tall, peaked P in II, III, aVF

(2) P-wave axis $\leq$ +15 degree

(3) positive aspect of P in V1 > 1.5 mm

(4) None of the above

61. Digitalis toxicity can produce

(1) prolonged PR interval

(2) alteration in T-wave morphology

(3) PAT with block

(4) All of the above

62. Right ventricular hypertrophy is indicated by all *except*

(1) right axis deviation > 90 degrees

(2) deep S-waves in LV leads

(3) Both (1) and (2)

(4) None of the above

63. Common findings in pulmonary embolism are all *except*

(1) S1Q3T3 pattern

(2) Sinus tachycardia

(3) RBBB

(4) Right axis deviation

64. All of the following can cause ST-depression *except*

(1) subendocardial ischemia

(2) early repolarization

(3) non-Q-MI

(4) reciprocal changes in acute Q-MI

65. All of the following can cause left axis deviation *except*

(1) left anterior hemiblock

(2) left posterior hemiblock

(3) artificial cardiac pacing

(4) None of the above

66. Characteristic radiological sign of pulmonary embolism are all *except*

(1) Westermark sign

(2) Fleischner's sign

(3) Hampton hump

(4) All of the above

67. Atypical pleural effusions in chest X-ray are all *except*

(1) lamellar effusion

(2) subpulmonic effusion

(3) loculated effusion

(4) None of the above

68. Very specific radiological feature of aortic dissection is

(1) Ring sign

(2) widened mediastinum

(3) left apical cap

(4) abnormal aortic knob

69. All of the following structures can produce radiological calcification *except*

(1) pericardium

(2) mitral valve

(3) inferior vena cava

(4) coronary arteries

70. Following are true about Kerley's lines *except*

(1) Kerley A lines radiate from the hilum

(2) Kerley C lines are short, criss-crossing lines

(3) Kerley B lines are best seen in the upper zone

(4) None of the above

71. Pulmonary plethora is detected by

(1) visualized pulmonary branches beyond inner 2/3rd of lungs

(2) 5 or more end on vessels in both lungs

(3) dilatation of upper and lower lobe vessels

(4) All of the above

72. Aortic enlargement in chest X-ray is seen in

(1) systemic hypertension

(2) aortic stenosis

(3) aortic regurgitation

(4) All of the above

73. Right atrial enlargement in chest X-ray is detected by all *except*

(1) right heart border > 5.5 cm from midline

(2) step like contour between right atrium and IVC

(3) Hoffman Rigler sign

(4) vertical extent > 50% height of right mediastinal contour

74. Normal pulmonary vasculature is characterized in the chest X-ray by all *except*

(1) Pulmonary vessels are usually not seen in lateral third

(2) size ratio of upper : lower vessels = 1/2 to 1/3rd

(3) convex hilar angle

(4) None of the above

75. Lateral view of the chest X-ray is particularly useful in following situations *except*

(1) to demonstrate retrosternal region

(2) to define interlobar effusion

(3) to assess cardiomegaly

(4) to localize lung pathology to a lobe

76. Ventricular septal defect can be caused by all *except*

(1) deficient development of proximal conus swelling

(2) failure of fusion of endocardial cushions

(3) Both (1) and (2)

(4) None of the above

77. Tetralogy of Fallot includes all *except*

(1) Pulmonary stenosis

(2) ASD

(3) Overriding of aorta

(4) None of the above

78. In ASD the defect can occur due to deficient development of all *except*

(1) septum primum

(2) septum secundum

(3) endocardial cushion

(4) None of the above

79. Transposition of great vessels is associated with all *except*

(1) failure of growth of truncoconal swellings

(2) VSD

(3) ASD

(4) PDA

80. All the following structures fuse with endocardial cushions *except*

(1) septum primum

(2) septum secundum

(3) Both (1) and (2)

(4) None of the above

81. All are true about myocardial energetics *except*

(1) FFA is used as a energy source in resting, fasting state

(2) Glucose is utilized in high glucose state

(3) Pyruvate is used during severe exercise

(4) None of the above

82. All can modulate vascular tone *except*

(1) Nitric Oxide

(2) Prostacyclin

(3) Thromboxane

(4) None of the above

83. Preload is influenced by

(1) venous return

(2) ventricular compliance

(3) atrial kick

(4) All of the above

84. Following are true about the venous waves *except*

(1) a-wave is due to atrial contraction

(2) x-descent is due to downward movement of tricuspid valve

(3) v-wave is due to ventricular contraction

(40 None of the above

85. Following are true about the role of calcium in cardiac contraction *except*

(1) myosin binding sites are blocked by tropomyosin when calcium level is high

(2) number of cross bridges depend on available calcium molecules

(3) during systole intracellular calcium rises by 50 times

(4) None of the above

86. All of the following drains into the coronary sinus *except*

(1) great cardiac vein

(2) venae cordis minimae

(3) small cardiac vein

(4) None of the above

87. Left anterior descending artery supplies all *except*

(1) anterior 2/3rd of intra-ventricular septum

(2) a part of right ventricle adjacent to the septum

(3) Both (1) and (2)

(4) None of the above

88. All are true about the conduction of impulse in the heart *except*

(1) impulses from AV node first reach the papillary muscles

(2) impulses from the SA node reach the interatrial septum near the opening of the coronary sinus

(3) impulse from right ventricular posterior papillary muscle reaches the anterior one via septo-marginal trabecula

(4) None of the above

89. Moderator band is the muscle band joining right ventricular

(1) anterior papillary muscle to the IVS

(2) posterior papillary muscle to the IVS

(3) anterior to the posterior papillary muscle

(4) None of the bove

90. All of the following drains into the right atrium *except*

(1) inferior vena cava

(2) venae cordis minimae

(3) right pulmonary vein

(4) superior vena cava