

**POST GRADUATE DIPLOMA IN CLINICAL
CARDIOLOGY (PGDCC)**

Term-End Examination

00337

June, 2016

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 Sheet.*
- (ii) *All questions are compulsory.*
- (iii) *Each question will have four options and only one of them is correct. Answers have to be 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 Sheet.*
- (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) *There will be 90 questions in this paper and each question carries equal marks.*
- (vi) *There will be no negative marking for wrong answers.*
- (vii) *No candidate shall leave the examination hall at least for one hour after the commencement of the examination.*

1. Which cardiac chamber does not contribute to cardiac silhouette in chest X-ray PA view ?
 - (1) Right atrium
 - (2) Right ventricle
 - (3) Left atrium
 - (4) Left ventricle

2. Regarding chest X-ray lateral view, which of the following statement is incorrect ?
 - (1) The obliteration of retro-sternal space suggest enlargement of right ventricle
 - (2) Helps in differentiating the thymus shadow in children from heart shadow
 - (3) Defines lobar pathology and assesses lobar volume loss
 - (4) Hoffman Rigler sign is due to LA enlargement

3. Which of the following statements regarding cardiac embryology is correct ?
 - (1) Normal cardiac looping is towards left side
 - (2) Developing heart began to beat by 8 weeks
 - (3) The left atrial appendage represents the embryonic atrium
 - (4) The failure of truncocoanal swelling to grow results in transposition of great arteries

4. Which of the following statements is not correct ?
 - (1) In right anterior oblique view the spine lies on the right of the heart shadow
 - (2) The aorta is better seen in left anterior oblique view
 - (3) Increase in convexity of pulmonary conus is seen in pulmonary arterial hypertension
 - (4) Straightening of left heart border is seen in PA enlargement

5. Blood pressure increases and heart rate decreases in response to :
 - (1) Exercise
 - (2) Increased body temperature
 - (3) Exposure to high altitude
 - (4) Increased intracranial tension

6. Increasing vagal stimulation of the heart will cause an increase in :
 - (1) Heart rate
 - (2) P-R interval
 - (3) Ventricular contractility
 - (4) Cardiac output

7. Persistence of a patent ductus arteriosus following birth causes :
 - (1) Diastolic murmur
 - (2) Systolic murmur
 - (3) Continuous murmur
 - (4) Gallop rhythm

8. The first heart sound coincides with :
 - (1) Isometric contraction phase
 - (2) Isometric relaxation phase
 - (3) Ejection phase
 - (4) Protodiastolic phase

9. Baroreceptors of carotid sinus and aortic arch are sensitive to :
 - (1) Increase in systolic pressure
 - (2) Increase in venous pressure
 - (3) Increase in pulse pressure
 - (4) Increase in ventricular pressure

10. Which of the following is not seen during isovolumetric (isometric) ventricular contraction ?
- (1) Increase of intraventricular pressure
 - (2) The semilunar valves remain closed
 - (3) Ejection of blood from the ventricles
 - (4) C wave of JVP
11. In the heart, cardiac muscle is not found in the :
- (1) Interatrial septum
 - (2) Interventricular septum
 - (3) SA node
 - (4) Valve cusps
12. All of the following are common consequences of congenital heart disease in the adult **except** :
- (1) Eisenmenger syndrome
 - (2) Erythrocytosis
 - (3) Infective endocarditis
 - (4) Stroke
13. Paired heart tubes are derived from :
- (1) Ectoderm
 - (2) Endoderm
 - (3) Neural crest
 - (4) Mesoderm
14. The parietal pericardium is derived from :
- (1) Paraxial Mesoderm
 - (2) Intermediate Mesoderm
 - (3) Head Mesenchyme
 - (4) Lateral Plate Somatic Mesoderm
15. Incomplete fusions of the endocardial cushions is usually associated with which of the following types of atrial septal defects ?
- (1) Primum
 - (2) Secundum
 - (3) Sinus Venosus
 - (4) Common atrium
16. The fetal left atrium is mainly derived from the :
- (1) Sinus venous
 - (2) Right pulmonary vein
 - (3) Primitive pulmonary vein
 - (4) Primitive atrium
17. Closure of the foramen primum results from the fusion of the :
- (1) Septum primum and the septum secundum
 - (2) Septum primum and the endocardial cushions
 - (3) Septum secundum and the septum spurium
 - (4) Septum secundum and the endocardial cushions
18. The fetal right atrium is mainly derived from the :
- (1) Primitive pulmonary vein
 - (2) Primitive atrium
 - (3) Sinus venarum
 - (4) Sinus venosus

19. Which of the following cause's rib-notching in a chest radiograph ?
 (1) Bidirectional Glenn shunt (2) Modified Blalock Taussig shunt
 (3) IVC occlusion (4) Coarctation of aorta
20. The chest view which is often useful to determine whether pleural abnormalities represent freely flowing fluids :
 (1) The PA view (2) The lateral view
 (3) Lateral decubitus view (4) Apical lordotic view
21. For visualization of diseases of lung apices, which view of chest is preferred ?
 (1) PA View (2) Lateral view
 (3) Lateral decubitus view (4) Apical lordotic view
22. Left Atrial enlargement is seen in :
 (1) AP View (2) PA View
 (3) Left Oblique View (4) Right Anterior Oblique View
23. In standing position, venous return to heart from the lower limbs is affected by all of the following **except** :
 (1) Competent valves (2) Deep fascia
 (3) Arterial pressure (4) Contraction of the calf muscles
24. In left subclavian artery, the branches of the first part of the subclavian artery are all **except** :
 (1) Costocervical trunk (2) Internal thoracic artery
 (3) Thyrocervical trunk (4) Vertebral artery
25. The heart is _____ to the lungs.
 (1) Superior (2) Dorsal (3) Medial (4) Lateral
26. Which of the following statements is **not** correct ?
 (1) The sinus venosus serves as the pacemaker of the heart of the young embryo
 (2) The septum primum completely divides the developing atrium into right and left compartments
 (3) In the adult heart, the sinus venosus is represented by the sino-atrial node
 (4) The two endocardial cushions divide the atrioventricular (av) canal into the right tricuspid and left bicuspid (mitral) canals
27. Which of the following statements is **not** correct ?
 (1) The atrioventricular node and atrioventricular bundle (of His) are derived from cells in the left wall of the sinus venosus and from cells in the atrioventricular canal
 (2) Probe patency of the foramen ovale does not permit shunting of blood from the right atrium to the left atrium in the neonate
 (3) The ostium primum lies between the septum primum and the endocardial cushions
 (4) The muscular portion of the interventricular septum is derived from the tissue of the endocardial cushions

28. In the foetal circulatory system mixing of oxygenated and deoxygenated blood occurs in all but one of the following :
- | | |
|-----------------------|------------------------|
| (1) Ductus arteriosus | (2) Inferior vena cave |
| (3) Left atrium | (4) Liver |
29. All the following are true with respect to heart development **except** :
- (1) The bulbus cordis and truncus arteriosus are separated longitudinally by a straight septum.
 - (2) The bulbus cordis and truncus arteriosus form the ascending aorta and pulmonary trunk.
 - (3) The atrioventricular node and bundle form from cells in the atrioventricular canal region and the sinus venosus.
 - (4) The sinoatrial node, and the atrioventricular node and bundle become richly innervated.
30. In Pericardial Effusion X-ray finding is :
- (1) Boot shaped heart
 - (2) Bottle shaped heart
 - (3) Straightening of left heart borders
 - (4) Straightening of right heart borders
31. All the following apply to bicuspid valve **except** :
- (1) It's also called Mitral Valve
 - (2) It's a Semi-lunar Valve
 - (3) Found on left side of Heart
 - (4) It prevents blood from, backward into left atrium
32. The Semi-lunar Valves prevent blood from flowing backward :
- | | |
|--------------------|------------------------|
| (1) Into the Atria | (2) Into the Ventricle |
| (3) Into the Brain | (4) Into Liver |
33. Blood flowing through a vein tends to :
- (1) Pulse
 - (2) Flow smoothly
 - (3) Flow at a faster rate than in the artery
 - (4) Carry Oxygen to the cells
34. Exchange of gases and nutrients between blood and tissue is the major function of :
- | | | | |
|----------------|--------------|-----------------|-----------|
| (1) Arterioles | (2) Arteries | (3) Capillaries | (4) Veins |
|----------------|--------------|-----------------|-----------|
35. The Pulse pressure of a person with arterial BP 160/100 mmHg is :
- | | | | |
|---------|---------|---------|--------|
| (1) 160 | (2) 100 | (3) 130 | (4) 60 |
|---------|---------|---------|--------|

36. The most important investigation for Pericardial Effusion is :
- (1) Lateral view of Chest X-ray
 - (2) E.C.G.
 - (3) Echocardiography
 - (4) Cardiac catheterization
37. The sternocostal surface of the heart consists of all the following "except" :
- (1) Right atrium
 - (2) Left atrium
 - (3) Right ventricle
 - (4) Left ventricle
38. The inferior border of the heart or diaphragmatic of the heart is formed by :
- (1) Right atrium
 - (2) One third by right ventricle and two third by left ventricle
 - (3) Two third by right ventricle and one third by left ventricle
 - (4) Only right ventricle
39. Which is "true" regarding Limbus fossa ovalis ?
- (1) It represents the embryonic septum primum
 - (2) It represents the lower curved edge of septum secundum
 - (3) It forms the lower margin of fossa ovalis
 - (4) None of the above
40. The papillary muscles are functionally related to :
- (1) Atria
 - (2) Atrioventricular valves
 - (3) Ventricles
 - (4) All of the above
41. Which is true regarding coronary arteries ?
- (1) The coronary arteries are functional end arteries
 - (2) There is no effective anastomosis between right and left coronary arteries
 - (3) Both are true
 - (4) Both are false
42. Which is not correct regarding right coronary artery ?
- (1) It arises from the left coronary sinus
 - (2) It runs along the anterior part of coronary sulcus
 - (3) It supplies to right atrium, right ventricle and conducting system of the heart
 - (4) All are correct
43. The diagonal artery is the branch of :
- (1) Anterior interventricular artery
 - (2) Left circumflex artery
 - (3) Right coronary artery
 - (4) None of the above

44. The "atrial systole" corresponds to :
- (1) The beginning of P wave (2) PR interval
(3) Beginning of QRS complex (4) None of the above
45. The Isovolumetric Contraction phase corresponds to :
- (1) Beginning of R wave on the ECG
(2) First heart sound on auscultation
(3) During this phase AV valve and semilunar valve are closed
(4) All of the above
46. Which is **true** regarding Isovolumetric Relaxation phase ?
- (1) It corresponds to the 3rd heart sound
(2) During this phase, the semilunar valve and atrioventricular valve both are opened
(3) The volume of ventricle remains the same and the ventricular pressure arises
(4) None of the above
47. Which of the following is a negative wave in Atrial pressure wave formed ?
- (1) "a" wave (2) "x" wave (3) "c" wave (4) "v" wave
48. Which of the following Atrial pressure wave forms indicates ventricular diastole ?
- (1) "a" wave (2) "x" descent (3) "v" wave (4) "y" descent
49. The partitioning and complete formation of fetal heart is seen by :
- (1) 4 weeks of gestation (2) 6 weeks of gestation
(3) 8 weeks of gestation (4) 12 weeks of gestation
50. Which of the following is **not** a part of "Bulbus cordis" ?
- (1) Bulbus cordis - the proximal portion forms the right ventricle
(2) Conus cordis
(3) Truncus arteriosus
(4) Aortic sac
51. Which is **correct** statement regarding Atrial partitioning ?
- (1) The partitioning of atrium begins with the appearance of septum primum
(2) It occurs about the 28th day
(3) The ostium secundum is formed by perforation in septum primum
(4) All are correct
52. The free edge of foramen ovale is formed by :
- (1) Septum primum (2) Septum secundum
(3) Septum spurium (4) All of the above

53. In the fetal heart, the sinus venosus receive blood from :
- (1) Vitelline vein
 - (2) Umbilical vein
 - (3) Common cardinal vein
 - (4) All of the above
54. The Sinoatrial Orifice is :
- (1) Communication between right and left horn of sinus venosus
 - (2) It is communication between sinus venosus and vitelline vein
 - (3) It is communication between sinus venosus and common cardinal vein
 - (4) It is communication between sinus venosus and primitive atrium
55. Which of the following structure gets obliterated in post natal life ?
- (1) The right sinus horn
 - (2) Right anterior cardinal vein
 - (3) Right vitelline vein
 - (4) Right umbilical vein
56. The superior vena cava forms by :
- (1) The right horn of sinus venosus
 - (2) The right anterior cardinal vein
 - (3) The right vitelline vein
 - (4) Right umbilical vein
57. The inferior vena cava forms by :
- (1) Right vitelline vein
 - (2) The right umbilical vein
 - (3) The left horn of sinus venosus
 - (4) Right anterior cardinal vein
58. The coronary sinus forms by :
- (1) The right horn of sinus venosus
 - (2) The left horn of sinus venosus
 - (3) The umbilical vein
 - (4) The common cardinal vein
59. The persistent atrioventricular canal is caused by :
- (1) Failure of the superior and inferior cushion to fuse
 - (2) Deficient development of conus swelling
 - (3) Failure of muscular portion of interventricular septum to fuse with free edge of conus septum
 - (4) Excessive diverticular of the muscular interventricular septum
60. Which of the following factor is responsible for occurrence of ventricular septal defect ?
- (1) Deficient development of the proximal conus swellings
 - (2) Failure of the muscular portion of the interventricular septum to fuse with the free edge of conus septum
 - (3) Failure of the endocardial cushions to fuse
 - (4) All of the above

61. Which is **not** correct regarding Dextrocardia ?
- (1) It occurs when the primitive heart tube holds to the left
 - (2) It occurs when the primitive heart tube holds to the right
 - (3) It usually occurs when all the organs systems are reversed (sinus inversus)
 - (4) All are correct
62. The Ventricular septal defect in Tetralogy of Fallot is located in :
- (1) Membranous septum
 - (2) Muscular septum
 - (3) Outlet septum
 - (4) It can be located anywhere
63. The single embryological error which leads to the occurrence of TOF is :
- (1) The straddling of aorta over the VSD
 - (2) The conal septum develops too far anteriorly
 - (3) Both of the above
 - (4) None of the above
64. Which of the following structure forms right border in postero-anterior view of X-ray ?
- (1) Right atrium plus SVC
 - (2) Right atrium plus Left atrium
 - (3) Right atrium plus right ventricle
 - (4) All of the above
65. The best radiological view to demonstrate lesions in restrosternal and costophrenic regions is :
- (1) Postero - anterior view
 - (2) Lateral view
 - (3) Right anterior oblique view
 - (4) Left anterior oblique view
66. The anterior margins of cardiac contours in lateral view is formed by :
- (1) Right ventricle and pulmonary trunk
 - (2) Left atrium and left ventricle
 - (3) Right atrium and right ventricle
 - (4) Right ventricle alone
67. The best radiological view to see the aorta is :
- (1) Lateral view
 - (2) Postero-anterior view
 - (3) Right anterior oblique view
 - (4) Left anterior oblique view
68. The "Hoffman Rigler Sign" is suggestive of :
- (1) Right atrial enlargement
 - (2) Left atrial enlargement
 - (3) Left ventricular enlargement
 - (4) Right ventricular enlargement

69. "Sternal Contact Sign" denotes :
- (1) Right atrial enlargement
 - (2) Right ventricular enlargement
 - (3) Pulmonary artery dilatation
 - (4) RV enlargement with pulmonary artery dilatation
70. The "double density sign" (increased density producing a convex border overlying or to the right of right heart border) indicates :
- (1) Posterior enlargement of left atrium
 - (2) Rightward enlargement of left atrium
 - (3) Superior enlargement of left atrium
 - (4) All of the above
71. The superior enlargement of left atrium manifest as :
- (1) An increased density producing a convex border overlying the right heart border (double density)
 - (2) Widening of carinal angle to more than 90 degrees
 - (3) Straightening and convexity of left heart border
 - (4) All of the above
72. Right atrial enlargement in PA view is suggested by :
- (1) The right heart border more than 3 cm from the midline
 - (2) Right heart border 4 cm more from the midline
 - (3) Right heart border more than 5.5 cm from midline
 - (4) Right heart border more than 7 cm from midline
73. Pulmonary plethora indicated by :
- (1) Pulmonary branches are visualized beyond the inner 2/3rd of lungs
 - (2) Vessels in the upper and lower lobes are dilated to the same degree
 - (3) The number of end on vessels seen is 5 or more in both lung fields (or 3 or more in one lung field)
 - (4) All of the above
74. Pericardial calcification is better seen on :
- (1) AP view
 - (2) Lateral view
 - (3) RA view
 - (4) LA view
75. Which of the following is **not** a radiological feature of pulmonary embolism ?
- (1) Ring sign
 - (2) Westermark sign
 - (3) Fleischner's sign
 - (4) Hampton hump

76. Which of the following radiological features is suggestive of dissection of the aorta ?
 (1) Widened mediastinum (2) Ring sign
 (3) Abnormal aortic knob (4) All of the above
77. 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
78. Which of the following is a feature of Pulmonary Venous Hypertension ?
 (1) Central atrial enlargement, manifesting as an increased convexity of the pulmonary conus
 (2) Enlargement of descending pulmonary artery
 (3) Sharp pruning of peripheral vasculature
 (4) Kerley B lines
79. Which of the following represents atrial systole in RA PRESSURE wave form ?
 (1) "a" wave (2) "c" wave (3) "v" wave (4) "y" wave
80. Which of the following structure is referred as Pacemaker of the heart ?
 (1) Sinoatrial node (2) A-V Node
 (3) Interatrial conduction tracts (4) Bundle of HIS
81. Which of the following structures is responsible for conduction of impulse from right to left atrium ?
 (1) Purkinje Fibers (2) Bundle of HIS
 (3) Bundle of Thorel (4) Bachman Bundle
82. The "PR" interval in surface EKG represents conduction of Impulse :
 (1) From SA node to AV node
 (2) From SA node to Bundle of HIS
 (3) From SA node to Bundle branches
 (4) From SA node to ventricular muscles
83. Which of the following waveform represents final phase of re-polarisation of cardiac action potential ?
 (1) P wave (2) QRS complex (3) T wave (4) U wave
84. The QRS amplitude is much higher than P wave because of :
 (1) Longer distance of travel of impulse
 (2) Slower rate of conduction through ventricular muscles
 (3) Depolarization of larger muscle mass
 (4) All of the above

