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MCC-002

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POST GRADUATE DIPLOMA IN CLINICAL CARDIOLOGY (PGDCC)

Term-End Examination

December, 2015

MCC - 002 : FUNDAMENTALS OF CARDIOVASCULAR SYSTEMS - II

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 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 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) *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. Ideal frequency of echocardiographic probe in a child is :

(1) 7.5 – 10 Mz (2) 5 – 8 Mz (3) 6 – 8 Mz (4) 2 – 5 Mz

2. Structures imaged in the parasternal short axis view (PSSAX) at the aortic level are the following except :

(1) Main pulmonary artery (2) RVOT

(3) Left pulmonary artery (4) Right atrium

3. The suprasternal notch view (long axis) visualizes the following except :

(1) Aortic arch (2) Right pulmonary artery

(3) Left pulmonary artery (4) Left atrium

4. Regarding Pulse wave Doppler all the following statements are correct except :

(1) Transducer has one crystal

(2) Transducer has two crystals

(3) Depth of interrogation can be fixed

(4) High velocity signals cannot be measured

5. Gradient across a valve is calculated from the formula :

(1) P = 4V (2) P = V2 (3) P = 4V2 (4) P = 4V3

6. If the IVC size is < 2 cm in diameter during expiration and collapses more than 50% during inspiration then the right atrial pressure would be :

(1) 0 – 5 mm of Hg (2) 5 – 10 mm of Hg

(3) 10 – 15 mm of Hg (4) 15 – 20 mm of Hg

7. The impaired LV diastolic function can be assessed by :

(1) Aortic velocity (2) Pulmonary velocity

(3) Tissue Doppler at mitral annulus (4) Isovolumetric contraction time

8. LV is divided into following number of segments to assess regional wall motion abnormality (RWMA) :

(1) 16 (2) 18 (3) 17 (4) 15

9. Pseudoaneurysm has all the following features except :

(1) Due to myocardial perforation

(2) Narrow neck

(3) Common with infero posterior MI

(4) Out pouching and thinning of segments

10. The echo features of cardiac tamponade are the following except :

(1) Late diastolic RA collapse (2) Early diastolic RV collapse

(3) Normal IVS motion (4) Dilated IVC

11. The normal expiratory increase in mitral valve flow is :

(1) 15% (2) 20% (3) 25% (4) 10%

12. Normal mitral valve has a cross sectional area of :

(1) $6-7\ cm^2$ (2) $3-4\ cm^2$ (3) $2-4\ cm^2$ (4) $4-6\ cm^2$

13. The area of regurgitant jet in severe mitral regurgitation is :

(1) $\geq 15\ cm^2$ (2) $\geq 8\ cm^2$ (3) $\geq 12\ cm^2$ (4) $\geq 20\ cm^2$

14. Severe mitral regurgitation can be diagnosed by echo Doppler criteria of all the following except :

(1) ERO $\geq 40\ mm^2$

(2) MR regurgitant volume ≥ 40 ml

(3) Pulmonary vein systolic flow reversal

(4) Dilated LA ≥ 5.5 cm

15. In moderate aortic stenosis aortic orifice area by continuity equation will be :

(1) $1.5\ cm^2$ (2) $0.8-1.2\ cm^2$ (3) $0.6-1.0\ cm^2$ (4) $0.4-0.8\ cm^2$

16. In aortic regurgitation, a pressure half time of 200 m/sec indicate :

(1) Mild aortic regurgitation (2) Trivial AR

(3) Severe AR (4) Moderate AR

17. Severe tricuspid regurgitation can be diagnosed in all the following except :
(1) Dense CW Doppler signal
(2) Colour flow regurgitation jet area $\geq 20\%$ of RA area
(3) Dilated IVC
(4) Holo systolic flow reversal in the hepatic veins

18. Great vessels are differentiated by :
(1) Origin from ventricle
(2) Morphology of semilunar valves
(3) Size of the vessel
(4) Branching pattern

19. ASD can be the following except :
(1) Ostium Primum
(2) Ostium Secundum
(3) Perimembranous
(4) Sinus venosus

20. The ASD which is part of endocardial cushion defect is :
(1) Ostium Primum
(2) Ostium Secundum
(3) Coronary sinus defect
(4) Sinus venosus defect

21. The best view to visualize patent ductus arteriosis is :
(1) Subxiphoid view
(2) Parasternal short axis view
(3) High parasternal view
(4) Apical 2 chamber view

22. The catheter with end hole and side holes is :
(1) Sones catheter
(2) Pig tail catheter
(3) Judkin catheter
(4) Cournand catheter

23. Mean pulmonary capillary wedge pressure (average) is (mmHg) :
(1) 12 (2) 16 (3) 7 (4) 9

24. For the diagnosis of ASD, the step up required for single sample assessment is :
(1) $\geq 11\%$ (2) $\geq 15\%$ (3) $\geq 9\%$ (4) $\geq 5\%$

25. Calculated mixed venous oxygen saturation from the following data will be :
SVC = 70% IVC = 74%
(1) 70% (2) 74% (3) 72% (4) 71%

26. In 40% of patients sinus nodal artery arises from :
(1) LAD (2) LCX (3) RCA (4) LM

27. Following is a self expandable stent :

(1) Wire coils (2) Slotted tubes (3) Modular stents (4) Wall stent

28. Contra indications to balloon mitral valvuloplasty are the following except :

(1) Left atrial thrombus (2) Moderate or more MR

(3) Pliable valve (4) Calcified valve

29. The advantage of 99 m Tc-Sestamibi over Thallium is :

(1) Shorter imaging time (2) Lower energy photons

(3) Longer half life (4) Cyclotron generated

30. Pulmonary embolism can be diagnosed in a ventilation/perfusion scintigraphy by :

(1) Lack of mismatch (2) Normal perfusion

(3) Mismatched defects (4) Abnormal ventilation

31. Ebstein's anomaly has all the following features except :

(1) Tricuspid Regurgitation

(2) Downward displacement of septal leaflet of tricuspid valve

(3) Cardiomegaly in X-ray chest PA view

(4) Delayed closure of mitral valve

32. A child with Ventricular Septal Defect (VSD) has a VSD flow velocity of 4 m/sec. If the systemic blood pressure of the child is 90/60 mm of Hg, the pulmonary artery systolic pressure will be :

(1) 90 mm of Hg (2) 26 mm of Hg (3) 60 mm of Hg (4) 52 mm of Hg

33. Thallium (201TI) has the following character :

(1) It is an anion

(2) Emits high energy electrons

(3) It has very low myocardial affinity

(4) Peak uptake in heart muscle occurs in 5 minutes after IV injection

34. In Gated Single Photon Emission computerized tomography, the wall thickening of left ventricle is visualized from following planes except :

(1) Short axis (2) Vertical long axis

(3) Saggital long axis (4) Horizontal long axis

35. During Nuclear Myocardial Scan, the lung to heart ratio of tracer uptake suggesting underlying severe CAD is :

(1) > 0.33 (2) > 0.60 (3) > 0.70 (4) > 0.40

36. "Mismatched Defects" in the lung can be diagnosed by :

(1) Echocardiography
(2) Ventilation Perfusion Scintigraphy
(3) Pulmonary Angiogram
(4) X-ray chest PA view

37. Complications of Ventriculography are the following except :

(1) Arrhythmias
(2) Endocardial staining
(3) Myocardial rupture
(4) Embolism

38. In left atrial pressure tracing the following statement is correct :

(1) A wave is greater than V wave
(2) V wave is greater than A wave
(3) A and V waves are of equal height
(4) A wave is absent

39. Left ventricular end diastolic pressure is (mm of Hg) :

(1) 5 – 12 (2) 1 – 7 (3) 10 – 15 (4) 0 – 2

40. Diagonal artery is a branch of :

(1) LAD (2) LCX (3) LM (4) RCA

41. Following statements are correct except :

(1) In a left dominant circulation LCX is bigger than LAD
(2) The obtuse marginal is a branch of LCX
(3) Acute marginal artery is a branch of LCX
(4) Left main arises from Left Aortic Sinus

42. The benefit of drug coated stent compared to bare metal stent is :

(1) Reduces restenosis
(2) Easily trackable
(3) Balloon is not required
(4) Lower risk of thrombosis

43. Inoue technique is used for :

(1) Coronary angioplasty (2) Balloon mitral valvuloplasty

(3) Balloon pulmonary valvuloplasty (4) Aortoplasty

44. A suitable valve for mitral valvuloplasty is one with Wilkins et al score of :

(1) < 8 (2) > 1.0 (3) 16 (4) 12 – 16

45. Positron Emission Tomography is useful in evaluating :

(1) Left ventricular function (2) Coronary anatomy

(3) Myocardial metabolism (4) Shunt lesions

46. A 30 year old obese adult presented with the clinical diagnosis of small ASD. Which of the following transducers will be chosen :

(1) 3.2 MHz (2) 5 MHz (3) 7.5 MHz (4) 10 MHz

47. 6 months old new born baby is born with history of recurrent lung infection for which Echo is done to rule out L → R Shunt. Which of the following transducer will be your choice ?

(1) 3.2 MHz (2) 5 MHz (3) 4.5 MHz (4) 7.5 MHz

48. Intravascular Ultrasound is useful for :

(1) Valvular Hemodynamics (2) LV function

(3) Intracoronary Hemodynamics (4) Pericardial assessment

49. Stress Echo is useful for assessment of :

(1) Viable Myocardium (2) Reversible ischemic

(3) Both of above (4) None of the above

50. Trans-esophageal Echo is useful for cardiac assessment in :

(1) Obese patient

(2) Emphysematous lung

(3) Intra-operative valvular assessment

(4) All of the above

51. Which Echocardiographic modality is most specific to rule out L→R shunts ?

(1) Stress Echocardiography (2) Fetal Echocardiography

(3) Contrast Echocardiography (4) I.V.U.S.

52. Regional wall motion abnormality is assessed in most sensitive and specific way by :

(1) Acoustic quantification (2) Harmonic imaging

(3) Tissue Doppler imaging (4) None of the above

53. Systolic Anterior motion of AML diagnostic of mitral valve prolapse is best assessed by :

(1) 2 D Echo (2) M-Mode (3) Contrast Echo (4) TEE

54. Colour Doppler of Echocardiography is based on principles of :

(1) Pulse Wave Doppler (2) Continuous Wave Doppler

(3) Both of the above (4) None of the above

55. Severe Aortic stenosis is best assessed by :

(1) Pulse Wave Doppler (2) Continuous Wave Doppler

(3) Both of the above (4) None of the above

56. In colour flow assessment blood flow going away from transducer is :

(1) Red (2) Mosaic (3) Blue (4) Any of the above

57. A young hypertensive presented to you and was found to have radiofemoral delay. Which view is best to assess proximal aortic co-arctation ?

(1) M-Mode (2) 2D Mode parasternal view

(3) Suprasternal view in 2D Echo (4) Short axis view with 2D Echo

58. In pulse wave doppler maximum measurable velocity without aliasing is usually less than :

(1) < 2 m/s (2) < 3 m/s (3) < 4 m/s (4) < 5 m/s

59. NYQUIST LIMIT in Doppler study is basically :

(1) Maximum measurable frequency

(2) Minimum measurable frequency

(3) True only for continuous wave measurement

(4) Clinically not important

60. Pressure half time measurement by continuous wave helps in assessment of valve area of :

(1) Mitral valve (2) Aortic valve

(3) Tricuspid valve (4) None of the above

61. Estimated RV systolic pressure in mitral stenosis patient with Tricuspid Regurgitation peak velocity of 4 m/s will be :

(1) 74 mm (2) 64 mm (3) 54 mm (4) 44 mm

62. If Pulmonary regurgitation End diastolic velocity = 3 m/sec predicted Pulmonary Artery diastolic pressure will be :

(1) 46 mm (2) 56 mm (3) 36 mm (4) 40 mm

63. Diastolic dysfunction of LV is suggested by which parameter of mitral valve overflow signal.

(1) A > E (2) Deceleration time of E > 240 m/sec^2

(3) Both of the above (4) None of the above

64. Earliest Echocardiographic sign of Ischemic heart Disease is :

(1) hypo kinetic wall motion (2) akinetic wall motion

(3) dyskinetic wall motion (4) any of the above

65. What are the normally found anomalies in Ischemic heart Disease Echocardiography except :

(1) Rigional wall motion abnormality

(2) Diastolic dysfunction of LV

(3) Valvular regurgitation

(4) Valvular stenosis

66. Ventricular Aneurysm is commoner in :

(1) Anterior wall MI (2) Posterior wall MI

(3) Inferior wall MI (4) None of the above

67. Which is the most specific sign of cardiac Tamponade ?

(1) Early diastolic RV collapse

(2) Late diastolic RA collapse

(3) Abnormal ventricular septal motion

(4) Dilated IVC with inspiratory collapse.

68. Aortic valve in ECHO eccentric closure is a feature of :

(1) Rheumatic involvement (2) Bicuspid valve

(3) Redegenerative valve (4) All the above

69. In Echocardiographic assessment of pericardial effusion compared to pleural effusion, pericardial effusion ends :

(1) Anterior to descending Aorta (2) Ends posterior to descending Aorta

(3) Any of the above (4) None of the above

70. Respiratory variation in mitral overflow velocity similar to cardiac tamponade seen in :

(1) Acute dilatation of heart (2) Pulmonary embolism

(3) RV infarct (4) All of the above

71. Pericardial effusion should be measured in (By Echocardiography) :

(1) Systole (2) Diastole

(3) Both phases (4) Any phase of cardiac cycle

72. In Hemodynamically significant mitral stenosis the mitral valve area is less than :

(1) 2.5 cm^2 (2) 2 cm^2 (3) 1.5 cm^2 (4) 1 cm^2

73. Balloon Mitral Valvotomy (BMV) is contraindicated if Echo shows :

(1) Mild Tip AML calcification (2) Mitral valve Area = 1.2 cm^2

(3) Trivial MR (4) LAA – clot

74. Which of the following is suggestive of severe Mitral Regurgitation by Echo assessment ?

(1) MR Jet Area $\geq$ 8 cm^2

(2) MR Regurgitant Volume $\geq$ 60 ml

(3) Pulmonary vein systolic flow reversal

(4) All of the above

75. Which of the following is diagnostic of Rheumatic heart disease in Echo assessment of valvular lesion ?

(1) Thickened Restricted PML (2) Mitral Regurgitation

(3) Dilated LA (4) All of the above

76. Most specific Echo-diagnostic feature of severe Aortic stenosis is :

(1) Aortic V Max > 3.9 ms^{-1}

(2) Peak gradient across AV = 78 mm

(3) Mean gradient across AV > 50 mm

(4) None of the above

77. Severity of Aortic stenosis in presence of LV dysfunction is best determined by :

(1) Associated mitral Regurgitation

(2) Aortic valve area by continuity equation

(3) Gradient across aortic valve

(4) All of the above

78. In continuous wave assessment of Aortic Regurgitation ; severe aortic regurgitation P½ is less than :

(1) < 250 m/sec (2) < 200 m/sec

(3) < 300 m/sec (4) None of the above

79. In severe AR ratio of Jet area divided by LVOT area is :

(1) > 25% (2) > 55% (3) > 60% (4) None of the above

80. Commonest aetiology of tricuspid stenosis is :

(1) RHD (2) TV - Endocardites

(3) Malignancy (4) All of the above

81. Severe TS is suggested by Echo studies show :

(1) Mean PG $\geq$ 7 mm Hg (2) PHT $\geq$ 190 mm

(3) None of the above (4) All of the above (1+2)

82. Organic - non PAH TR is caused by :

(1) Infective endocarditis (2) RV infarct

(3) Carcinoid (4) All of the above

83. Which type of ASD may be treated with device closure ?

(1) Ostium primum ASD (2) Sinus venosus ASD

(3) ASD secundun (4) None of the above

84. Which type of VSD is associated with Aortic valve prolapse ?
(1) Inlet VSD
(2) Muscular VSD
(3) Doubly committed VSD
(4) Perimembranous VSD

85. Left atrial appendage in transthoracic echo best seen in :
(1) Apical 4 chamber view
(2) Parasternal long axis view
(3) Parasternal short axis view at aortic level
(4) Suprasternal view

86. Normal valve of TAPSE :
(1) 5 mm (2) 10 mm (3) 15 mm (4) 20 mm

87. Normal valve of EPSS :
(1) < 6 mm (2) 6 – 10 mm (3) 10 – 14 mm (4) 14 – 18 mm

88. Usual location of right and left coronary arteries in parasternal short axis view :
(1) 1 O'Clock and 7 O'Clock
(2) 4 O'Clock and 11 O'Clock
(3) 5 O'Clock and 10 O'Clock
(4) 6 O'Clock and 12 O'Clock

89. PDA usually opens in :
(1) Main pulmonary artery
(2) Right pulmonary artery
(3) Left pulmonary artery
(4) Right ventricle

90. O_2 step up at ventricular level is seen in which of the following conditions ?
(1) Aberrant coronary artery origin
(2) AP window
(3) PDA with pulmonary regurgitation
(4) ASD