

15200

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

Term-End Examination

June, 2016

**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) *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. In aortic stenosis, the following is a grave sign :
 - (1) Calcified valve
 - (2) Bicuspid valve
 - (3) LV hypertrophy
 - (4) Pulmonary hypertension

2. Vena contracta is
 - (1) Venous drainage of left ventricle
 - (2) Narrowest portion of mitral regurgitation jet downstream from the orifice
 - (3) Systolic flow in pulmonary vein
 - (4) Distended IVC

3. In aortic regurgitation, pressure half time of 200 msec indicates
 - (1) Mild aortic regurgitation
 - (2) Trivial aortic regurgitation
 - (3) Severe aortic regurgitation
 - (4) Moderate aortic regurgitation

4. A mean pressure gradient of 8 mm of Hg across tricuspid valve indicates
 - (1) Moderate tricuspid stenosis
 - (2) Mild tricuspid stenosis
 - (3) Severe tricuspid stenosis
 - (4) Trivial tricuspid stenosis

5. The ventricular septal defects which are amenable to device closure are
 - (1) Inlet and Muscular VSDs
 - (2) Inlet and Doubly committed VSDs
 - (3) Inlet and Peri-membranous VSDs
 - (4) Muscular and Peri-membranous VSDs

6. Device closure is possible in all of the following *except*
- (1) Peri-membranous ventricular septal defect
 - (2) Primum atrial septal defect
 - (3) Patent ductus Arteriosus
 - (4) Fossa ovalis atrial septal defect
7. Which of the echo methods is used for mitral valve area immediately after balloon mitral valvotomy ?
- (1) Pressure half time
 - (2) Planimetry
 - (3) Colour Doppler
 - (4) Pulse wave Doppler
8. Which is the *incorrect* statement regarding restrictive filling in diastolic dysfunction ?
- (1) Deceleration time > 160 msec
 - (2) E/A > 1.5
 - (3) Isovolumetric relaxation time < 70 msec
 - (4) Mitral A duration < PVa duration
9. What is the normal range of isovolumetric relaxation time measured by echocardiography ?
- (1) < 90 msec
 - (2) 70 – 90 msec
 - (3) 90 – 110 msec
 - (4) 120 – 150 msec
10. All of the following are morphological features of left ventricle seen by echo *except*
- (1) Finely trabeculated
 - (2) Moderator band
 - (3) Attached to valve placed more towards atria
 - (4) Papillary muscles not attached to septum

11. Mitral valve area by pressure half time (PHT) is calculated by which of the following formulae ?
- (1) $120/\text{PHT}$ in cm^2
 - (2) $220/\text{PHT}$ in cm^2
 - (3) $\text{PHT}/220$ in cm^2
 - (4) $\text{PHT}/120$ in cm^2
12. Which is the commonest cause of isolated aortic stenosis ?
- (1) Degenerative aortic valve disease
 - (2) Congenital bicuspid aortic valve disease
 - (3) Rheumatic heart disease
 - (4) Syphilitic aortic valve disease
13. 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) Atrial septal defect
14. Treatment of choice in significant left main coronary artery is
- (1) Coronary artery bypass graft surgery
 - (2) Medical therapy
 - (3) Angioplasty
 - (4) Enhanced external counter pulsation (EECP)
15. Amplatz Catheter is used for which of the following procedures ?
- (1) Renal angiogram
 - (2) Coronary angiogram
 - (3) Carotid angiogram
 - (4) Peripheral angiogram

16. All of the following drugs are used in drug coated stent *except*
- (1) Sirolimus
 - (2) Everolimus
 - (3) Zanolimus
 - (4) Cyclosporin
17. A 77-year-old male, known case of hypertension, euglycemic, underwent herniography on left side. Three days after surgery, before discharge, he developed sudden chest discomfort. He was cyanosed and restless. His blood pressure was 90/60 mmHg. His ECG showed sinus tachycardia and ST depression in V1-V3. His echo showed normal LV function and dilated RA and RV. Calculated PA pressure is 56/26 mmHg. This patient has which of the following problems ?
- (1) Unstable angina
 - (2) Non-ST elevation myocardial infarction
 - (3) Acute pulmonary embolism
 - (4) Restrictive cardiomyopathy
18. The first percutaneous coronary angioplasty was performed in a conscious patient in 1977 by
- (1) Judkins
 - (2) Dotter
 - (3) Andreas Gruentzig
 - (4) Amplatz
19. The ideal frequency of echocardiographic probe in a child is
- (1) 7.5 – 10 MHz
 - (2) 5 – 8 MHz
 - (3) 6 – 8 MHz
 - (4) 2 – 5 MHz

20. Gradient across a valve is calculated by the formula

- (1) $P = 4V$
- (2) $P = V^2$
- (3) $P = 4V^2$
- (4) $P = 4V^3$

21. Normal mitral valve has a cross-sectional area of

- (1) 6 – 7 cm²
- (2) 3 – 4 cm²
- (3) 2 – 4 cm²
- (4) 4 – 6 cm²

22. Several mitral regurgitation can be diagnosed by echo Doppler criteria of all the following *except*

- (1) EROA > 0.40 cm²
- (2) MR Regurgitant volume > 40 ml
- (3) Pulmonary vein systolic flow reversal
- (4) Vena contracta > 0.7 cm

23. ASD can be the following *except*

- (1) Ostium Primum
- (2) Ostium Secundum
- (3) Peri-membranous
- (4) Sinus venosus

24. Treatment of choice for Ostium primum ASD is

- (1) Surgical correction
- (2) Stem cell therapy
- (3) Device closure
- (4) Medical therapy

- 25.** For the diagnosis of ASD, the step-up required for single sample assessment is
- (1) > 11%
 - (2) > 15%
 - (3) > 9%
 - (4) > 5%
- 26.** Contraindications to balloon mitral valvuloplasty are all the following *except*
- (1) Left atrial thrombus
 - (2) Moderate or more MR
 - (3) Pliable valve
 - (4) Calcified valve
- 27.** Ebstien'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
- 28.** "Mismatched Defects" in the lung can be diagnosed by
- (1) Echocardiography
 - (2) Ventilation Perfusion Scintigraphy
 - (3) Myocardial rupture
 - (4) Embolism
- 29.** Diagonal artery is a branch of
- (1) LAD
 - (2) LCX
 - (3) LM
 - (4) RCA

- 30.** Inoue technique is used for
- (1) Coronary angioplasty
 - (2) Balloon mitral valvuloplasty
 - (3) Balloon pulmonary valvuloplasty
 - (4) Aortoplasty
- 31.** Trans-esophageal Echo is useful for the assessment of
- (1) Obese patient
 - (2) Emphysematous lung
 - (3) Intra-operative valvular assessment
 - (4) All of the above
- 32.** Severe aortic stenosis is best assessed by
- (1) Pulse Wave Doppler
 - (2) Continuous Wave Doppler
 - (3) Both the above
 - (4) None of the above
- 33.** Ventricular aneurysm is more common in
- (1) Anterior wall MI
 - (2) Posterior wall MI
 - (3) Inferior wall MI
 - (4) None of the above
- 34.** Which type of ASD may be treated with device closure ?
- (1) Ostium primum ASD
 - (2) Sinus venosus ASD
 - (3) ASD secundum
 - (4) None of the above

- 35.** Which type of VSD is associated with aortic valve prolapse ?
- (1) Intel VSD
 - (2) Muscular VSD
 - (3) Doubly committed VSD
 - (4) Peri-membranous VSD
- 36.** Normal valve of EPSS is
- (1) < 6 mm
 - (2) 6 – 10 mm
 - (3) 10 – 14 mm
 - (4) 14 – 18 mm
- 37.** Which is the correct statement with regard to 2-D Echo ?
- (1) Higher the frequency, higher the penetration
 - (2) In obese adult, high frequency transducer is used
 - (3) Higher the frequency, better is the resolution
 - (4) In young children, 2 MHz transducer is best for 2-D Echo
- 38.** For diagnosis of mitral stenosis, which procedure is considered to be gold standard ?
- (1) Angiography
 - (2) CT Angio
 - (3) MRI Study
 - (4) Echo Doppler Study
- 39.** Select the *wrong* statement.
- (1) Moderate MS if MV area is 0.5 to 1 cm²
 - (2) Severe MS if MV area is < 1.5 cm²
 - (3) Mild MS if resting mean gradient is < 5 mmHg
 - (4) Severe MS if resting mean gradient is > 10 mmHg

- 40.** Absolute contraindication for pulmonary angiography is
- (1) Pulmonary arterial hypertension
 - (2) Anaphylactoid reaction to i/v contrast
 - (3) Renal dysfunction
 - (4) All of the above
- 41.** All of the following criteria are absolute indications for termination of exercise test *except* one :
- (1) Moderate to severe angina
 - (2) Subject desire to stop
 - (3) Dizziness or near syncope
 - (4) Atrial ectopics
- 42.** Components of an angioplasty include all of the following *except* one :
- (1) Wire coils
 - (2) Indiflator
 - (3) Balloons
 - (4) Guiding catheters
- 43.** Mullins' dilator sheath is used for which of the following procedures ?
- (1) Coronary angiogram
 - (2) Percutaneous renal angioplasty
 - (3) Transatrial septal puncture
 - (4) Carotid angioplasty
- 44.** Which of the following pharmacological agents is routinely used in stress echocardiogram ?
- (1) Amyl nitrate
 - (2) Dobutamine
 - (3) Sodium nitroprusside
 - (4) Hydralazine

45. Doppler calculations involve all of the following *except*
- (1) Simplified Bernoulli equation
 - (2) Velocity time intervals
 - (3) Pressure half time
 - (4) Planimetry
46. What frequency range is used for adult echocardiography ?
- (1) 7.5 – 10 MHz
 - (2) 1.5 – 2 MHz
 - (3) 2 – 5 MHz
 - (4) 5 – 7.5 MHz
47. Which cardiac structure *cannot* be seen in 4-chamber view ?
- (1) RA & RV
 - (2) RA & LV
 - (3) LV & Aorta
 - (4) PA & RV outflow tract
48. IVC is 2.7 cm with < 25% collapse, TR jet is 4 cm². Estimated PA systolic pressure is
- (1) 64 mmHg
 - (2) 50 mmHg
 - (3) 100 mmHg
 - (4) 84 mmHg
49. Which is the best view to visualize PDA ?
- (1) Apical four-chamber
 - (2) Subcostal
 - (3) Short axis view
 - (4) High parasternal view

- 50.** Wilkins scoring system in echocardiography is used in which valve stenosis grading ?
- (1) Aortic regurgitation
 - (2) Pulmonic stenosis
 - (3) Coronary artery disease
 - (4) Mitral stenosis
- 51.** Severe mitral stenosis has MVA as
- (1) < 3.0
 - (2) < 2.5
 - (3) < 2.0
 - (4) < 1.5
- 52.** What is the most specific echo sign of cardiac tamponade ?
- (1) Late diastolic RA collapse
 - (2) Abnormal IVS motion
 - (3) Early diastolic collapse
 - (4) Variation of mitral velocity > 40%
- 53.** What is the gold standard test for pulmonary embolism ?
- (1) Pulmonary angiography
 - (2) Chest X-ray
 - (3) V-Q Scan
 - (4) Echocardiography
- 54.** In atrial 5-chamber view, all are seen *except*
- (1) Both atria
 - (2) Ascending aorta
 - (3) Both ventricles
 - (4) RV outflow tract

- 55.** Septal arteries are branches of
- (1) LAD
 - (2) LCx
 - (3) RCA
 - (4) None of the above
- 56.** To perform an oximetry run, the catheter used is
- (1) Pigtail catheter
 - (2) Judkins right catheter
 - (3) Sones catheter
 - (4) Swan Ganz balloon flotation catheter
- 57.** Myocardial metabolism can be studied by which of the following ?
- (1) PET-CT
 - (2) Coronary angiography
 - (3) Echocardiography
 - (4) Doppler imaging
- 58.** LV systolic function can be assessed by all *except*
- (1) Eye balling
 - (2) Modified Simpson method
 - (3) M-Mode echo
 - (4) Tissue Doppler
- 59.** Swinging motion of the heart is seen in
- (1) Myocardial infarction
 - (2) Cardiac tamponade
 - (3) Massive pericardial effusion
 - (4) Constrictive pericarditis
- 60.** A PHT of 700 msec indicates
- (1) Moderate aortic regurgitation
 - (2) Severe aortic regurgitation
 - (3) Mild aortic regurgitation
 - (4) Severe aortic stenosis

- 61.** Morphological RV is recognized by all *except*
- (1) Moderator band
 - (2) Fine trabeculations
 - (3) Infundibulum
 - (4) TV-PV discontinuity
- 62.** If TAPSE is less than _____ it is an indicator of RV systolic dysfunction.
- (1) 2.0
 - (2) 1.6
 - (3) 1.8
 - (4) 2.5
- 63.** Normal range of LV end diastolic pressure is
- (1) 5 – 12 mmHg
 - (2) 10 – 14 mmHg
 - (3) 3 – 8 mmHg
 - (4) 8 – 14 mmHg
- 64.** Severe tricuspid stenosis is defined as mean diastolic pressure gradient
- (1) > 7 mmHg
 - (2) > 5 mmHg
 - (3) > 3 mmHg
 - (4) None of the above is true
- 65.** Normal deceleration time of mitral flow is
- (1) > 240 msec
 - (2) < 160 msec
 - (3) 160 – 240 msec
 - (4) 120 – 160 msec

- 66.** Vena contracta is used for the assessment of
- (1) Severity of stenosis
 - (2) Systolic flow in pulmonary vein
 - (3) Severity of regurgitation jet
 - (4) RA pressure
- 67.** V/Q scan has high negative predictive value for diagnosis of
- (1) Pulmonary edema
 - (2) Pulmonary embolism
 - (3) Pulmonary tuberculosis
 - (4) Pulmonary atresia
- 68.** Tiger catheter is used for coronary angiography in
- (1) Brachial route
 - (2) Radial route
 - (3) Femoral route
 - (4) Axillary route
- 69.** Severe pulmonary stenosis is defined as the peak pressure
- (1) > 90 mmHg
 - (2) > 64 mmHg
 - (3) > 60 mmHg
 - (4) > 40 mmHg
- 70.** Which is *not* a form of ASD ?
- (1) Primum
 - (2) AV canal
 - (3) Sinus venosus
 - (4) Peri-membranous

- 71.** LA is dilated if
- (1) > 38 mm
 - (2) > 40 mm
 - (3) > 32 mm
 - (4) None of the above is true
- 72.** Which one of the following is a common congenital cardiac abnormality at birth ?
- (1) ASD
 - (2) VSD
 - (3) TOF
 - (4) TQA
- 73.** Normal value of RV free wall thickness is
- (1) 1 – 2 mm
 - (2) 3 – 4 mm
 - (3) 5 – 7 mm
 - (4) 8 – 10 mm
- 74.** Following is *not* a feature of athletes heart :
- (1) Dilatation of LV cavity
 - (2) Reduction of LV cavity
 - (3) Increase in LV wall thickness
 - (4) Increase in LV mass
- 75.** SAM is seen in
- (1) Constrictive pericarditis
 - (2) Hypertrophic obstructive cardiomyopathy
 - (3) Concentric LVH
 - (4) Severe mitral stenosis
- 76.** Diagnostic sensitivity in stress echocardiography is higher with
- (1) Single vessel disease
 - (2) Double vessel disease
 - (3) Triple vessel disease
 - (4) None of the above

77. Which of the following statements is *incorrect* ?
- (1) LVOT is well-visualised in Parasternal long axis view.
 - (2) RVOT is well-visualised in Parasternal short axis view.
 - (3) Mitral valve orifice and aortic valve orifice areas can be estimated in PLAX view.
 - (4) Mitral and tricuspid valve septal insertion is well-seen in apical view.
78. Following are the contraindications for balloon mitral valvotomy *except*
- (1) Severe mitral stenosis
 - (2) Grade-III mitral regurgitation
 - (3) LA clot
 - (4) Commisural calcification
79. In a 17-segment echocardiographic analysis, hypokinesia of basal anterior and basal anteroseptal segments, akinesia of mid anterior and mid anteroseptal segments and dyskinesia of apical septal, apical anterior and apical segments are seen. Which is the LV wall motion score index ?
- (1) 1.3
 - (2) 1.5
 - (3) 1.7
 - (4) 1.9
80. The following agents can be used for pharmacological stress *except*
- (1) Adenosine
 - (2) Dipyridamole
 - (3) Dobutamine
 - (4) Digoxin
81. Which of the following LV segments is *not* supplied by left circumflex artery ?
- (1) Basal anterior lateral
 - (2) Mid anterior lateral
 - (3) Apical lateral
 - (4) Apical anterior

- 82.** Following are the Class-I indications for coronary angiogram *except*
- (1) Class-III or Class-IV exertional angina in spite of adequate medical therapy
 - (2) Resuscitated from sudden cardiac death
 - (3) Acute stent closure following PCI
 - (4) Coronary calcifications in CT coronary angiogram
- 83.** Diameter of the left main coronary artery is
- (1) 4.5 + 0.5 cm
 - (2) 7 + 3 cm
 - (3) 2 + 5 cm
 - (4) 5 + 3 cm
- 84.** The most ideal echocardiographic examination to assess cardiac chamber size is
- (1) M-Mode
 - (2) 2-D Echocardiography
 - (3) Pulse Doppler
 - (4) Colour Doppler
- 85.** Haemodynamic information in echocardiographic examination is obtained from
- (1) M-Mode
 - (2) 2-D Echo
 - (3) 3-D Echocardiography
 - (4) Doppler Examination
- 86.** Following are the structures imaged in the standard apical 4-chamber view *except*
- (1) Left ventricle
 - (2) Right ventricle
 - (3) Aorta
 - (4) Right atrium

87. The following examination is useful to record high velocities :

- (1) Pulse Doppler
- (2) Continuous Wave Doppler
- (3) Colour Doppler
- (4) 3-D Echocardiography

88. Following are the structures imaged in the apical 5-chamber view *except*

- (1) Left ventricle
- (2) Left atrium
- (3) Aorta
- (4) Pulmonary artery

89. Nyquist limit is a sampling phenomenon encountered in

- (1) Continuous Wave Doppler
- (2) Pulse Wave Doppler
- (3) 2-D Echo
- (4) 3-D Echo

90. Normally contracting LV has a wall motion score index of

- (1) 0
- (2) 1
- (3) 2
- (4) 3