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ROLL NUMBER

**WRITTEN TEST FOR THE POST OF TECHNICAL
ASSISTANT(CARDIOLOGY) – A**

DATE : 21/02/2017

TIME : 09.30 AM

DURATION : 90 MINUTES

TOTAL MARKS : 80

INSTRUCTIONS TO THE CANDIDATE

1. Write your Roll Number on the top of the Question Booklet and in the OMR sheet.
2. Each question carries 1 mark.
3. There will not be any Negative Marking.
4. Darken only the bubble corresponding to the most appropriate answer.
5. Marking more than one answer will invalidate the answer.
6. Candidate should sign in the question paper and OMR sheet.
7. Candidate should hand over the question paper and OMR sheet to the invigilator before leaving the examination hall.

Signature of the Candidate

WRITTEN TEST FOR THE POST OF TECHNICAL ASSISTANT (CARDIOLOGY) – A

1. Changing from a 2 MHz to a 5 MHz ultrasound transducer would generally produce:
A. Faster imaging B. Reduced tissue penetration
C. Longer wavelength D. Longer ultrasound pulses
2. The percentage error when ultrasound beam makes an angle of 20 degrees to blood column is
A. 3 B. 7 C. 15 D. 30
3. Which wave represents Repolarization of Purkinjee Fibres?
A. P wave B. QRS complex C. T wave D. U wave
4. The limb sensor which placed in Left 5th ICS at Anterior axillary line ?
A. V1 B. V2 C. V5 D. V6
5. The 12 lead EKG is produced by application of the following to the patient:
A. 12 electrodes B. 10 electrodes C. 5 electrodes D. 6 electrodes
6. Which of the following is the best protocol to use for sicker patients?
A. Modified Bruce Protocol B. Common Stress Test Protocol
C. Naughton Protocol D. Bruce Protocol
7. 1MET is equivalent to
A. 1.5 mL O₂/kg/min of body weight B. 2.5 mL O₂/kg/min of body weight
C. 3.5 mL O₂/kg/min of body weight D. 4.5 mL O₂/kg/min of body weight
8. Coronary Angiographic catheter all **except**
A. Sones B. Judkins C. Amplatz D. Cournard
9. Aortic valve area in cardiac cath lab by
A. Gorlin formula B. Continuity equation
C. Cournards formula D. Strass formula
10. Device closure done in all **except**
A. Membranous VSD B. Ostium primum ASD C. PDA D. Coronary AV fistula
11. Tissue Doppler is a modification of
A. PW Doppler B. CW Doppler C. CFM D. M mode
12. Normal LV end diastolic volume is
A. 50-90 ml/m² B. 90-120 ml/m² C. < 30 ml/m² D. 30-50 ml/m²
13. MV area when PHT is 110 is
A. 1 B. 2 C. 1.5 D. 0.5
14. Sgarbossa criteria is used for
A. RBBB + MI B. LBBB + MI C. RBBB D. LBBB
15. Mc Connell's sign on ECHO seen in
A. Cardiac tamponade B. Constrictive pericarditis
C. Pulmonary hypertension D. Pulmonary embolism
16. Spider view is
A. LAO 45 cranial 30 B. PA cranial 30
C. RAO 45 cranial 30 D. LAO 45 caudal 30
17. Wilkins score used in
A. MR B. MS C. AR D. AS

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18. Dampening during CAG
A. Decrease in systolic pressure
B. Absent dye reflux
C. Waveforms like ventricular pressure tracings
D. Inadequate opacification of coronary arteries
19. On CAG, severe coronary stenosis is
A. > 50 % in LAD B. > 50 % in RCA C. > 50 % in LMCA D. >50% in LCX
20. MVP is defined as displacement of mitral leaflets into LA during systole on ECHO by
A. > 1 mm B. > 2 mm C. > 3 mm D. > 4 mm
21. Hemodynamically significant obstruction in FFR is
A. < 1 B. < 0.25 C. < 0.50 D. < 0.75
22. Very late stent thrombosis
A. > 30 days B. > 3 months C. > 6 months D. > 12 months
23. Spade like appearance on LV angiogram seen in
A. MVP B. HCM C. VSR D. LV aneurysm
24. Following are used in Percutaneous ballon mitral valvotomy, **except**
A. Fogarty catheter B. Inoue balloon C. Brockenbrough needle D. Mullins sheath
25. Watchman device used for
A. ASD closure B. VSD closure C. LAA occlusion D. PDA closure
26. catheter used for Left ventriculography
A. Sones catheter B. Halo catheter C. Amplatz catheter D. Newton catheter
27. VSDs in left ventriculography best identified by
A. 30 RAO view B. Pa view C. 60 LAO view D. Lateral view
28. Newton catheter used for
A. Left ventriculography B. Aortography
C. Coronary angiography D. Carotid angiography
29. Inoue balloon is used in
A. Balloon aortic valvuloplasty B. Balloon pulmonary valvuloplasty
C. Balloon mitral valvuloplasty D. Transcatheter Aortic Valve Replacement
30. Contraindication for IABP
A. Acute MR B. VSR C. Aortic dissection D. Cardiogenic shock
31. PAH is defined as
A. mPAP >25 mmHg with PCWP < 15 mmHg B. mPAP < 25 mmHg with PCWP < 15 mmHg
C. mPAP >25 mmHg with PCWP > 15 mmHg D. mPAP < 25 mmHg with PCWP > 15 mmHg
32. MVO₂ is defined as
A. 4 x SVC + IVC/3 B. 3 x SVC + IVC/4 C. SVC +3 x IVC/4 D. SVC + 4 x IVC/3
33. Chronotropic incompetence is determined by TMT if inability to increase heart rate to at least of age- predicted maximum
A. 85% B. 70% C. 90% D. 75%

WRITTEN TEST FOR THE POST OF TECHNICAL ASSISTANT (CARDIOLOGY) – A

34. Which is **not** an absolute contra indication of exercise testing
A. Acute MI less than 2 days B. First degree AV block
C. Severe symptomatic AS D. Acute myocarditis
35. Normal LA area in cm² is
A. < 20 B. < 30 C. <33 D. 30-40
36. In normal ECG lead ii indicate voltage difference between
A. Left arm & right arm B. Left leg & right arm
C. Left leg & Left arm D. Left leg & left arm plus right arm
37. Sokolow – Lyon voltage criteria for LVH
A. R in a VL more than 20 B. R in a VL more than 11
C. R in a VL more than 15 D. R in a VL more than 35
38. Treatment of ventricular fibrillation is
A. Atropine B. Adrenaline C. Amiodarone D. DC shock
39. Infero lateral segment is
A. RCA B. LAD C. RAMUS D. LCX
40. Identify the **false** statement
A. Presence of B notch denotes LV dysfunction B. EPSS is not accurate if patient has AR
C. EPSS > 15 denotes severe LV dysfunction D. MPI < 0.5 denotes LV dysfunction
41. Trans thoracic echo is superior to trans oesophageal echo in ...
A. Assessing prosthetic valve function B. Assessing LA clot
C. Diagnosing infective endocarditis D. Assessing LV systolic function
42. Which is the method recommended by American society of echocardiography for EF estimation
A. Teicholz B. Quinones C. Area length D. Simpson's biplane
43. PISA stands for
A. Proximal isovolumetric surface area B. Proximal isovelocity surface area
C. Pulmonary isovolumetric surface area D. Proximal isoventricular surface area
44. Measurements in M mode is done from
A. Leading edge to leading edge B. Inner edge to inner edge
C. Outer edge to outer edge D. Leading edge to inner edge
45. Aortic dimension is normally maximum at the level of
A. Aortic annulus B. Transaortic sinus C. Sinotubular junction D. Aortic arch
46. During M mode examination of the mitral valve leaflets, the "D" point marks the valve position
A. At onset of ventricular diastole B. During rapid filling phase
C. During atrial contraction D. At onset of ventricular systole
47. The following structures are seen in PLAX view **except**
A. Left atrium B. Left ventricle C. Right atrium D. Aorta
48. Pivoting or twisting of the transducer from a fixed position on the chest wall either clockwise or anticlockwise is called
A. Rotation B. Angulation C. Tilting D. Movement

WRITTEN TEST FOR THE POST OF TECHNICAL ASSISTANT (CARDIOLOGY) – A

49. Aortic arch is best visualized from the following view
A. PLAX B. Subcostal C. Suprasternal D. Apical
50. SAM (systolic anterior motion of anterior mitral leaflet) is seen in
A. Mitral atenosis B. HCM C. Mitral regurgitation D. Concentric LVH
51. True about nyquistlimit (NL)
A. $NL = 2 \times$ Pulse Repetition frequency B. $NL =$ Pulse Repetition frequency
C. $NL = \frac{1}{2} \times$ Pulse Repetition frequency D. $NL = 4 \times$ Pulse Repetition frequency
52. During inspiration, in tricuspid valve normally
A. There is a slight increase in E and A waves B. There is a slight decrease in E and A waves
C. There is no change in E and A waves D. There is increase in E and decrease in A
53. Ejection fraction is
A. $LVEDV - LVESV / LVEDV \times 100$ B. $LVESV - LVEDV / LVEDV \times 100$
C. $LVEDV - LVESV / LVESV \times 100$ D. $LVESV - LVEDV / LVESV \times 100$
54. In Doppler echocardiography, blood flow moving towards the transducer is traditionally displayed as
A. White B. Red C. Blue D. Black
55. The no. of cycles that pass a given point per second is
A. Wavelength B. Period C. Frequency D. Amplitude
56. In M mode, the movements of mitral valve anterior leaflet has
A. Z configuration B. M configuration C. W configuration D. L configuration
57. M mode examination in pulmonary stenosis shows
A. Absent or diminished 'a' wave B. Midsystolic notching of pulmonary valve
C. Increased MAPSE D. Prominent 'a' wave
58. "Dropout" artefacts of the interatrial septum can be eliminated by using
A. PLAX view B. subcostal view C. apical D. parasternal short axis
59. Crab view is
A. Suprasternal long axis view B. Suprasternal short axis view
C. PLAX view D. Apical 2 chamber view
60. The "Vcut off" sign is an indicator of significant regurgitation in
A. AV valves B. Semilunar valves C. Both AV and semilunar valves D. PDA
61. In severe tricuspid regurgitation, systolic flow reversal is seen in
A. Pulmonary veins B. Descending aorta C. Ascending aorta D. Hepatic veins
62. Nodule of Arantius is seen in
A. Mitral Valve B. Aortic valve C. Pulmonary valve D. Tricuspid valve
63. Loss of ultrasound as it passes through a medium is called
A. Rarefaction B. Refraction C. Attenuation D. Reflection
64. Turbulent flow generally occurs when Reynold's number exceeds
A. 800 B. 1000 C. 2000 D. 4000

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65. Pulse wave is preferred to continuous wave doppler to assess flow in all **except**
- A. Pulmonary vein
 - B. Superior venacava
 - C. Pulmonary valve
 - D. Aortic valve
66. For measuring LV end diastolic and end systolic dimensions for calculating EF, M- mode is taken at
- A. The mitral valve annulus
 - B. The level of mitral valve tips
 - C. Below the papillary muscles
 - D. The apex
67. Frequency of waves used in diagnostic ultrasound is
- A. 2 to 10 MHz
 - B. 20-40 MHz
 - C. 100-200 MHz
 - D. 200-400 MHz
68. In the mitral inflow trace, the following wave is seen due to atrial contraction
- A. E wave
 - B. A wave
 - C. C wave
 - D. D wave
69. Aortoseptal and mitral- aortic continuity is best appreciated from
- A. PLAX view
 - B. Subcostal view
 - C. Parasternal short axis view
 - D. suprasternal view
70. Normal cardiac index is (in L/min/m²)
- A. 1.2-2.4
 - B. 2.8-4.2
 - C. 4.2-6.4
 - D. 6.4-8.4
71. The volume of blood ejected during one cardiac cycle is called
- A. Cardiac output
 - B. Cardiac index
 - C. Stroke volume
 - D. Cross sectional area
72. The first phase of ventricular diastole is
- A. Isovolumic relaxation phase
 - B. The rapid filling phase
 - C. Diastasis or slow filling phase
 - D. The atrial filling phase
73. Moderator band is a part of
- A. RV
 - B. RA
 - C. LV
 - D. LA
74. Near field and far field of an ultrasound beam are named respectively as
- A. Fresnel and Fraunhofer zone
 - B. Fraun and Hofer zone
 - C. Doppler zone and lateral zone
 - D. Snells and Rayleigh zone
75. As per the American society of echocardiography recommendations, the end diastole measurements must be made from which part of the ECG?
- A. Onset of P wave
 - B. Onset of QRS complex
 - C. End of QRS complex
 - D. Onset of T wave
76. GAIN is a function of of receiving signals
- A. Density
 - B. Amplitude
 - C. Frequency
 - D. Velocity
77. Normal LV mass index is (in g/m²)
- A. 30-50
 - B. 80-120
 - C. 160-200
 - D. 200-240
78. "B notch" in the mitral M mode trace indicates
- A. Elevated LVESP
 - B. Elevated LVEDP
 - C. Reduced LVESP
 - D. Reduced LVEDP
79. Cardiac crux is best visualized in
- A. PLAX
 - B. PSAX
 - C. Apical 4 chamber
 - D. Suprasternal
80. A patient has a blood pressure of 130/80 mm Hg. The VSD gradient is 106 mm Hg. The RVSP is
- A. 14
 - B. 24
 - C. 36
 - D. 48

TECHNICAL ASSISTANT (CARDIOLOGY)- A
ANSWER KEY (21/02/2017)

1	B	21	D	41	D	61	D
2	B	22	D	42	D	62	B
3	D	23	B	43	B	63	C
4	C	24	A	44	A	64	C
5	B	25	C	45	B	65	D
6	C	26	B	46	A	66	B
7	C	27	C	47	C	67	A
8	D	28	D	48	A	68	B
9	A	29	C	49	C	69	A
10	B	30	C	50	B	70	B
11	A	31	A	51	C	71	C
12	D	32	B	52	A	72	A
13	B	33	A	53	A	73	A
14	B	34	B	54	B	74	A
15	D	35	A	55	C	75	B
16	D	36	B	56	B	76	B
17	B	37	B	57	D	77	B
18	A	38	D	58	B	78	B
19	C	39	D	59	B	79	C
20	B	40	D	60	A	80	B