



SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY

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ROLL NUMBER

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

DATE: 07/09/2023

TIME: 11 To 12.30 pm

DURATION: 90 MINUTES

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Write your Roll Number on the top of the Question Booklet and in the OMR sheet.
2. Each question carries one (1) mark.
3. There will be no Negative Marking.
4. Each question carries 4 options i.e., A, B, C & D. Darken completely, the bubble corresponding to the most appropriate answer using blue or black ball point pen.
5. Marking more than one option will invalidate the answer.
6. Candidate should sign in the question paper and OMR sheet.
7. No clarifications will be given.
8. Candidate should hand over the OMR sheet and question paper to the invigilator before leaving the examination hall.

Signature of the Candidate

Rupa Sreedhar
7/9/2023

TECHNICAL ASSISTANT CARDIOLOGY 07/09/2023

- 1) The positive electrode when recording lead aVL on an EKG is
- left arm
 - left leg
 - right leg
 - left arm + left leg
- 2) The PR interval of an ECG represents
- The time between atrial depolarization and ventricular depolarization
 - The time between ventricular depolarization and ventricular repolarization
 - The time between atrial depolarization and atrial repolarization
 - The time between ventricular repolarization and the next heartbeat
- 3) Which one of the following is correct regarding ultrasound?
- Speed through body tissues is 1540 m/sec
 - Speed is higher in water compared to body tissues
 - Penetrates well through air
 - Backscatter occurs when passing through homogenous tissue
- 4) The ECG lead where all the waves are inverted is
- V1
 - aVF
 - aVR
 - V5
- 5) Leads V3 and V4 represent which of the following views of the heart?
- Septal
 - Inferior
 - Anterior
 - Lateral
- 6) Lead aVF records actual potential in
- Right arm
 - Left arm

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- c. Right foot
- d. Left foot

7) Tall tented T waves seen in the ECG indicates

- a. Hypokalemia
- b. Hyponatremia
- c. Hyperkalemia
- d. Hypercalcemia

8) Radiation dose in the Catheterisation laboratory can be decreased by all EXCEPT

- a. Collimation
- b. Increasing frame rate
- c. increasing distance of operator from the tube
- d. using roadmap

9) The heart valve most commonly affected by rheumatic heart disease is?

- a. Aortic Valve
- b. Mitral Valve
- c. Pulmonary Valve
- d. Tricuspid valve

10) Ventricular Hypertrophy in ECG is indicated by increased amplitude of

- a. P wave
- b. QRS complex
- c. T wave
- d. U wave

11) Which is the standard lead placement used in Treadmill testing?

- a. Mason-likar 12 lead placement
- b. standard 12 lead placement
- c. Frank lead placement
- d. Einthoven's 6 lead placement

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12) T wave of the ECG represents

- a. Atrial depolarisation
- b. Atrial repolarisation
- c. Ventricular depolarisation
- d. Ventricular repolarisation

13) Which of the following transducers will have the best resolution?

- a. Transducer with 2 to 5 Mhz
- b. Transducer with 9 to 11 MHz
- c. Transducer with 15-20 Mhz
- d. Transducer with 6 to 8 Mhz

14) All are true about Holter monitoring EXCEPT

- a. Chest should be free of hair.
- b). Recording is done for 24 hours at least.
- c. Ideally patient should be at bed rest.
- d. Can diagnose ischemic heart disease.

15) All the following can cause irregular pulse in a patient EXCEPT

- a. Atrial ectopics
- b. Atrial fibrillation
- c. Ventricular fibrillation
- d, Ventricular ectopics

16) Target heart rate for TMT testing is

- a. 150+age
- b. 200+age

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- c. 220-age
- d. 220-resting heart rate

17) The thickness of the interventricular septum in a normal adult is?

- a. 1.5 mm
- b. 10 mm
- c. 5 mm
- d. 20 mm

18. SAM (Systolic anterior motion) is a classical sign in echocardiography in which of the following conditions?

- a. Mitral stenosis
- b. HOCM
- c. TOF
- d. Mitral Valve Prolapse

19. A technical error in recording ECG by lead reversal is most easily identified by looking at

- a. aVF
- b. V1
- c. aVR
- d. V6

20. During Treadmill Testing a patient developed Ventricular Fibrillation. You will be defibrillating the patient with how much Joules using a biphasic defibrillator?

- a. 50 J
- b. 200 J
- c. 100 J
- d. 360 J

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21. In a patient with low voltage complexes in ECG which is most likely?

- a. Pulmonary embolism
- b. Myocardial Infarction
- c. Cardiac tumor
- d. Pericardial effusion

22. Oxygen saturation is highest in which one of the following locations?

- a. LA
- b. RA
- c. PA
- d. IVC

23. TAPSE is an echocardiographic method used for determining _____

- a. RV systolic function
- b. RV diastolic function
- c. LV systolic function
- d. LV diastolic function

24. Heart Failure is diagnosed using which biomarker?

- a. D-dimer
- b. Troponin-T
- c. NT-pro BNP
- d. Troponin-I

25. What is the purpose of the ground electrode in an ECG?

- a. To reduce interference from other electrical signals in the body
- b. To provide a reference point for the other electrodes.
- c. To amplify the electrical signals from the heart.
- d. To filter out unwanted electrical signals from the heart.

26. What is the normal heart rate range for an adult?

- a. 60-100 beats per minute
- b. 70-120 beats per minute
- c. 80-130 beats per minute

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d. 90-140 beats per minute

27. What is the purpose of an implantable loop recorder?

- a. To record the heart's electrical activity for a 24-hour period.
- b. To diagnose heart arrhythmias.
- c. To assess the severity of heart disease.
- d. To diagnose heart failure

28. Which one of the following is NOT an indication to stop a TMT test?

- a. Chest pain
- b. Giddiness
- c. ST elevation of 2mm in V1 to V6
- d. ST depression of 1mm in II III aVf

29. What is the primary purpose of color Doppler imaging in echocardiography?

- a. To measure blood pressure
- b. To assess valvular regurgitation and stenosis
- c. To visualize the sub-valvular apparatus
- d. To assess cardiac chamber size

30. In a standard 12-lead ECG, how many electrodes are used for recording electrical signals from the heart?

- a. 12
- b. 4
- c. 6
- d. 10

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31. What should you do if an automated external defibrillator (AED) is available when performing CPR on an adult victim?

- a. Continue CPR until Emergency Medical Services (EMS) arrives
- b. Use the AED as soon as possible
- c. Administer medications before using the AED
- d. Wait for the victim to regain consciousness

32. What is the correct hand placement for chest compressions on a child during CPR?

- a. Just above the manubrium
- b. Over the xiphoid process
- c. In the center of the chest, below the nipple line
- d. Over the lower half of the sternum

33. How deep should chest compressions be for adult CPR?

- a. 1 inch (2.5 cm)
- b. 2 inches (5 cm)
- c. 3 inches (7.5 cm)
- d. 4 inches (10 cm)

34. Which of the following catheters is used to perform a Coronary Angiogram via the radial route?

- a. Judkins Catheter
- b. Pigtail
- c. TIG (Tiger)
- d. EBU (Extra Backup Catheter)

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35. In the catheterisation lab, what is the purpose of the "ALARA" principle?

- a. To maximize non radiation exposure
- b. To minimize radiation exposure
- c. To calculate radiation dosages
- d. To track radiation sources

36. In the catheterization lab, which personnel are at the highest risk of radiation exposure?

- a. Nurses
- b. Radiologic technologists
- c. Cardiologists
- d. Maintenance staff

37. The most anteriorly placed valve is

- a. mitral
- b. aortic
- c. tricuspid
- d. pulmonary

38. Lowest oxygen saturation is seen in

- a. Coronary Sinus
- b. Pulmonary Vein
- c. Pulmonary Artery
- d. Right Ventricle

39. Best imaging method to guide an ASD device closure is

- a. Trans-thoracic echo
- b. Transesophageal echo
- c. Rotational angiography
- d. IVUS

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40. Which of the following drugs increase the blood pressure?

- a. Esmolol
- b. Insulin
- c. Adrenalin
- d. Digoxin

41. Gas used in Rotablator is

- a. Oxygen
- b. Carbon dioxide
- c. Helium
- d. Nitrogen

42. Gas used in IABP

- a. Oxygen
- b. Carbon dioxide
- c. Helium
- d. Nitrogen

43. Typical radiation dose of diagnostic cardiac catheterization is millisievert (mSv)

- a. 0.5-1
- b. 3-5
- c. 10-15
- d. 50-100

44. One French size in a catheter equals ----- mm

- a. 0.11
- b. 0.22
- c. 0.33
- d. 0.44

45. Which one of the following is a normal pressure (mmHg)?

- a. RA mean 18
- b. RVED 4

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c. LVED 20

d. PAED 25

46. During isovolumic relaxation:

a. Mitral valve is open

b. Aortic valve is closed

c. Tricuspid valve is open

d. Pulmonary valve is open

47. Which is true in chronic total occlusion of coronary arteries?

a. PCI is preferred to CABG

b. Duration of occlusion affects the ability to cross with guide wire

c. long segment occlusion is easily crossed with wire

d. drug eluting stents do not improve outcomes

48. Gas used for angiography in patients with renal failure is

a. Oxygen

b. Carbon dioxide

c. Helium

d. Nitrogen

49. What is the primary function of heparin when used in the cardiac catheterization laboratory?

a. To increase blood pressure

b. To prevent infection

c. To dissolve atheromatous plaques

d. To prevent clot formation during the procedure

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50. Which drug is commonly used to reverse the effects of heparin after a catheterization procedure?

- a. Nitroglycerin
- b. Epinephrine
- c. Protamine
- d. Atropine

51. What is the primary purpose of administering nitroglycerin in the cardiac catheterization laboratory?

- a. To reduce blood pressure
- b. To slow down the heart rate
- c. To dilate coronary arteries and relieve angina
- d. To prevent blood clots

52. What is the primary role of drugs like clopidogrel and aspirin in patients undergoing cardiac catheterization laboratory procedures?

- a. To reduce blood pressure
- b. To prevent blood clotting inside stents
- c. To increase heart rate
- d. To treat arrhythmias

53. What is the primary purpose of a guidewire in the cardiac catheterization laboratory?

- a. To measure blood pressure
- b. To deliver contrast dye
- c. To guide catheters through blood vessels
- d. To monitor heart rhythm

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54. 3D echo is NOT useful for which of the following?

- a. ASD
- b. VSD
- c. PDA
- d. MS

55. When intra-arterial pressure line is ZEROed, the pressure is

- a. equal to atmospheric pressure
- b. equal to systolic blood pressure
- c. equal to diastolic blood pressure
- d. equal to mean arterial blood pressure

56. Fractional Flow Reserve (FFR) is used to evaluate

- a. Coronary artery
- b. Mitral Valve
- c. Pericardial pressure
- d. Exercise capacity

57. Which one of the following catheters has a balloon attached near the tip?

- a. Pig tail
- b. Swan Ganz
- c. NIH
- d. IVUS

58. Oxygen saturation levels (SpO₂) between and are considered normal at sea level.

- a. 50% and 60%
- b. 60 and 70%
- c. 75 and 90%

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d. 96% and 100%

59. The smallest square in an ECG paper is

a. 1mm x 1mm

b. 2mm x 2mm

c. 5mm x 5mm

d. 10 mm x 10mm

60. What is the role of a sheath introducer in the cardiac catheterization laboratory?

a. To measure blood pressure

b. To remove excess fluid from the heart

c. To provide access to blood vessels and guide wires and catheters

d. To measure oxygen saturation in the blood

61. ECG was first developed by?

a. Steward

b. Willem Einthoven

c. Koch

d. Hubbert Mann

62. What is the primary function of a balloon dilatation catheter (balloon catheter) in the cardiac catheterization laboratory?

a. To guide other catheters through blood vessels

b. To measure cardiac output

c. To inflate and open narrowed or blocked arteries

d. To measure blood pressure in the lungs

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63. What is the primary action of beta-blockers when used in the cardiac catheterization laboratory?

- a. To dilate blood vessels
- b. To increase heart rate
- c. To decrease heart rate and lower blood pressure
- d. To dissolve blood clots

64. Which of the following is not a reentrant tachycardia?

- a. sinus tachycardia
- b. atrial flutter
- c. atrial fibrillation
- d. torsades de pointes

65. Which one of the following is FALSE?

- a. AV node receives blood supply from Left Circumflex in 80% of patients
- b. AV node is located near the apex of triangle of Koch
- c. Sinus node is supplied by RCA in 65% of patients
- d. Sinus node is situated at the junction of Right Atrium and Superior Vena Cava

66. Which one of the following is TRUE regarding implantable loop recorder?

- a. Duration is 1-2 years
- b. Documentation of rare events possible
- c. Transmission is continuous
- d. Full ECG disclosure is available

Durga Sreedhar
2/9/2023

67. Which one of the following is FALSE in VT?

- a. VT storm is >than 3 episodes in 24 hours requiring intervention to terminate
- b. >30 sec without haemodynamic collapse is non sustained VT
- c. Sustained VT can last for <30 sec with haemodynamic collapse
- d. Polymorphic VT has changing morphology beat to beat

68. In coronary angioplasty, drug eluting stents are used in

- a. high bleeding risk
- b. inability to comply with dual antiplatelet therapy
- c. primary PCI in STEMI
- d. CABG planned within 3 months

69. Which of the following is LEAST useful in diagnosis of HOCM?

- a. ECG
- b. Holter
- c. Angiogram
- d. Oximetry

70. Which of the following CANNOT be closed with a vascular plug?

- a. PDA
- b. arteriovenous fistula
- c. paravalvular leak
- d. VSD

71. Which percutaneous procedure is not indicated before corrective surgery in TOF?

*Question number 71
is deleted*

*Surya Sreedhar
21/9/2023*

- a. PA stent for pulmonary artery stenosis
- b. pulmonary valve implantation
- c. VSD closure
- d. ICD

72. IABP will NOT result in

- a. increased aortic diastolic pressure
- b. increased coronary flow
- c. increased myocardial oxygen demand
- d. decreased LVEDP

73. Which is FALSE regarding IVUS?

- a. Provides physiological information
- b. Complimentary to angiography
- c. Measures lesion length
- d. Guides PCI

74. Which is FALSE regarding Optical Coherence Tomography (OCT)?

- a. Employs Near -Infrared Light
- b. Larger probe than IVUS
- c. Better resolution than IVUS for plaque characteristics
- d. Helps to assess stent malapposition

75. Absolute contraindication to exercise testing include all the following EXCEPT

- a. Recent onset rest angina

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- b. Severe aortic stenosis
- c. Mobitz type 2 AV block
- d. Recent tachyarrhythmia

76. Pulmonary blood flow is 8 L/min. systemic blood flow is 4 L/min. shunt ratio is:

- a. 0.5:1
- b. 2:1
- c. 4:1
- d. 12:1

77. The following is an indicator of good anchoring of the pacing lead into the myocardium.

- a. Sensed R wave more than 5
- b. Impedance within normal range
- c. Current of injury in the local electrogram
- d. Threshold less than 1

78. Which is FALSE regarding ICD

- a. Can function like a pacemaker
- b. Can prevent Ventricular tachycardia
- c. Can deliver high voltage shock in the tune of 700V
- d. Can terminate VT by anti-tachycardia pacing

79. During an EP study, the signals are noted to be particularly noisy probably due to electrical interference. The following are useful to tackle the problem EXCEPT

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- a. Grounding and shielding
- b. Balancing and differential amplification
- c. Filtering
- d. Coiling the cables

80. Normal range of lead impedance of pacemakers

- a. 30- 130 ohms
- b. 500- 5000 ohms
- c. 300 - 1500 ohms
- d. Less than 500 ohms

81. In FFR, which is FALSE?

- a. Intracoronary adenosine can be used
- b. 0.75 indicates ischaemia
- c. Value limited in acute coronary syndrome
- d. Cannot be used in multivessel PCI

82. During implantation of percutaneous aortic valve, the fluoroscopic view which shows all the three cusps in the same line is called

- a. Cusp overlap view
- b. Coplanar view
- c. Commissural view
- d. Deployment view

83. Which of the following is not done routinely in primary angioplasty

- a. Pre-dilatation of the lesion

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- b. Liberal use of NTG prior to stenting
- c. Maintaining ACT above 250 sec
- d. Post dilatation

84. Best fluoroscopic view to delineate LMCA ostium is

- a. LAO cranial
- b. RAO caudal
- c. AP caudal
- d. Lateral

85. Which is FALSE about bifurcation stenting?

- a. Culotte is a two-stent strategy
- b. DK Crush method can be done using 6F guiding catheter
- c. Mini crush is a single stent strategy
- d. Provisional stenting is the most common strategy used

86. All of the medications are mandatory for coronary angioplasty EXCEPT

- a. Heparin
- b. Statins
- c. Aspirin
- d. Beta blocker

87. Among the following modalities which is the most useful modality to plan LMCA stenting?

- a. OCT
- b. IVUS
- c. CT coronary angiogram

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d. FFR

88. An implantable cardioverter is capable of all the following EXCEPT

- a. Sensing VF.
- b. Terminating VT by pacing.
- c. Bradycardia pacing
- d. Physiological pacing

89. Narrow complex tachycardia with near simultaneous activation of atria and ventricles is

- a. AVNRT
- b. Atrial tachycardia
- c. Orthodromic AVRT
- d. Antidromic AVRT

90. The usual power delivered for ablation of an accessory pathway at AV annulus is

- a. 5-20W.
- b. 20-40W
- c. 40-60W
- d. 80-100W

91. 14 mm Atrial septal occluder has

- a. Waist of 14 mm
- b. Left atrial disc of 14 mm
- c. Right atrial disc of 14 mm
- d. Both atrial discs of 14 mm

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92. All are symmetric devices EXCEPT

- a. Muscular VSD occluder
- b. ASD occluder
- c. ADO II
- d. Vascular plug

93. Patent ductus arteriosus is viewed best in which angiographic projection?

- a. LAO
- b. RAO
- c. AP
- d. Lateral

94. Balloon commonly used in balloon aortic valvotomy in newborns

- a. Z-med balloon
- b. Andra balloon
- c. Advance balloon
- d. Tyshak balloon

95. Normal H-V interval is

- a. 30 -50 msec
- b. 50-150 msec
- c. 10-25 msec
- d. 170-290 msec

Deepa Sreedhar
21/9/2023

96. Terms used to describe a guidewire include all EXCEPT:

- a. Length
- b. Diameter
- c. Compliance
- d. Tip confirmation

97. which is TRUE of Judkins coronary catheters?

- a. Size of aortic root decides size of catheter
- b. Right catheter needs clockwise rotation to engage ostium
- c. Cannot be used for brachial approach
- d. Heat modification can give Judkins 7.0 size catheter

98. Which is FALSE regarding coronary angioplasty?

- a. bare metal stents can be used if compliance regarding antiplatelet drugs is uncertain
- b. drug eluting stents give good results in long lesions
- c. embolic protection devices are useful in graft PCI
- d. principle of atherectomy is displacement of plaque

99. During echocardiography for VSD, which of the following CANNOT be assessed?

- a. pulmonary hypertension
- b. pulmonary vascular resistance
- c. ventricular function
- d. size of defect

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7/9/2023

100. which of the following is NOT amenable for total correction by percutaneous method?

- a. Sinus venosus ASD
- b. TOF
- c. Secundum ASD
- d. Muscular VSD

Repa Sreedhar
2/9/2023

ANSWER KEY FOR TECHNICAL ASSISTANT CARDIOLOGY 07/09/2023

Q.NO	Ans	Q.NO	Ans	Q.NO	Ans	Q.NO	Ans	Q.NO	Ans
1	a	2	a	3	a	4	c	5	c
6	d	7	c	8	d	9	b	10	b
11	a	12	d	13	c	14	c	15	c
16	c	17	b	18	b	19	c	20	b
21	d	22	a	23	a	24	c	25	a
26	a	27	b	28	d	29	b	30	d
31	b	32	c	33	b	34	c	35	b
36	c	37	d	38	a	39	b	40	c
41	d	42	c	43	b	44	c	45	b
46	b	47	b	48	b	49	d	50	c
51	c	52	b	53	c	54	c	55	a
56	a	57	b	58	d	59	a	60	c
61	b	62	c	63	c	64	a	65	a
66	b	67	b	68	d	69	d	70	d
71	X	72	c	73	a	74	b	75	d
76	b	77	c	78	b	79	d	80	c
81	d	82	b	83	d	84	a	85	c
86	d	87	b	88	d	89	a	90	c
91	a	92	b	93	d	94	d	95	a
96	c	97	c	98	d	99	b	100	b

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