



BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Sc.(MRIT)-2022/B.Sc.(MRIT)-2023

Course Name – Ultrasonography & Echocardiography

Course Code - BMRITC604

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) How is atrial fibrillation categorized based on its duration and presentation?
 - a) By heart rate
 - b) By the presence of P waves
 - c) By its impact on the ventricles
 - d) By duration and presentation
- (ii) What symptom may be associated with AVNRT, triggered by factors like emotional stress or caffeine?
 - a) Fever
 - b) Headache
 - c) Palpitations
 - d) Back pain
- (iii) Which of the following is a common symptom of ventricular tachycardia?
 - a) Fever
 - b) Chest pain
 - c) Blurred vision
 - d) Joint swelling
- (iv) Which type of heart block involves a complete blockage of electrical impulses between the atria and ventricles?
 - a) First-degree heart block
 - b) Mobitz Type I heart block
 - c) Mobitz Type II heart block
 - d) Third-degree heart block
- (v) Identify that what does the PR interval represent in an ECG.
 - a) Ventricular depolarization.
 - b) Ventricular repolarization.
 - c) Atrial repolarization.
 - d) Atrial depolarization.
- (vi) What is the primary application of 2D echocardiography in clinical practice?
 - a) To evaluate cardiac valve motion.
 - b) To measure electrical conduction in the heart.
 - c) To assess lung ventilation.
 - d) To evaluate liver function.
- (vii) Which of the following Doppler modes is best used to measure blood velocity in a specific cardiac structure?
 - a) Colour Doppler.
 - b) Pulse-wave Doppler.
 - c) M-mode.
 - d) 2D echocardiography.
- (viii) Which echocardiographic view provides the best assessment of left ventricular function?

- a) Parasternal short-axis.
- c) Suprasternal.
- (ix) Which echocardiographic measurement is essential in diagnosing diastolic dysfunction?
 - a) E/A ratio in mitral inflow.
 - c) Aortic valve area.
 - b) Apical four-chamber.
 - d) Subcostal.
- (x) Identify the correct purpose of ultrasound gel.
 - a) To increase the comfort of the patient.
 - c) To increase the speed of sound.
 - b) To prevent air interference with sound waves.
 - d) To amplify the sound waves.
- (xi) Identify which of the following is the most common artifact in ultrasound.
 - a) Enhancement
 - c) Reverberation
 - b) Shadowing
 - d) Aliasing
- (xii) Identify the function of the transducer's matching layer.
 - a) To amplify the sound waves.
 - c) To reduce reflection at the transducer-tissue interface.
 - b) To prevent echo formation.
 - d) To increase tissue penetration.
- (xiii) Define the term 'acoustic impedance' in ultrasound.
 - a) The measure of tissue elasticity.
 - c) The rate of sound wave speed.
 - b) The resistance to sound wave transmission in a medium.
 - d) The capacity of tissues to absorb sound waves.
- (xiv) Identify the most common use of ultrasound in obstetrics.
 - a) To measure fetal heart rate
 - c) To detect birth defects in the mother
 - b) To visualize fetal development and position
 - d) To measure maternal blood pressure
- (xv) Define the role of a gel in ultrasound.
 - a) To prevent air interference.
 - c) To amplify ultrasound signals.
 - b) To increase tissue penetration.
 - d) To reduce the image quality.

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Analyze the importance of cardiac output. (3)
- 3. Define gray scale imaging in ultrasound. (3)
- 4. Compare 2D echocardiography and M-mode echocardiography. (3)
- 5. Explain the role of harmonic imaging in ultrasound. (3)
- 6. Analyze how echocardiographic parameters help differentiate between systolic and diastolic heart failure. (3)

OR

Differentiate the echocardiographic findings of mitral stenosis and mitral regurgitation. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Describe different types of supraventricular tachycardias. (5)
- 8. Explain how ultrasound gel is used during ultrasound imaging and why it is essential for obtaining high-quality images. (5)
- 9. Discuss the basic components of an ultrasound machine, including the transducer, scanner, and monitor, and explain their functions in image formation. (5)
- 10. Analyze the advantages and limitations of stress echocardiography in coronary artery disease assessment. (5)
- 11. Differentiate between normal and abnormal left ventricular wall motion using echocardiographic criteria. (5)
- 12. Integrate echocardiographic imaging techniques for diagnosing congenital heart diseases. (5)

OR

Analyze the impact of echocardiographic window selection on image quality and accuracy. (5)

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Programme - B.Sc. (Hons.) in Health Sciences
Course Name - Ultrasonography & Radiography
Course Code - BASH1001
(Semester VI)

Answer the following questions, choosing the most appropriate:

1. Which of the following is not a true statement regarding the use of the parasternal short-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

2. Which of the following is not a true statement regarding the use of the parasternal long-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

3. Which of the following is not a true statement regarding the use of the parasternal short-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

4. Which of the following is not a true statement regarding the use of the parasternal long-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

5. Which of the following is not a true statement regarding the use of the parasternal short-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

6. Which of the following is not a true statement regarding the use of the parasternal long-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

7. Which of the following is not a true statement regarding the use of the parasternal short-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

8. Which of the following is not a true statement regarding the use of the parasternal long-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.

9. Which of the following is not a true statement regarding the use of the parasternal short-axis view?

- a) It is the most common view for measuring the left ventricular diameter.
- b) It is the most common view for measuring the left ventricular mass.
- c) It is the most common view for measuring the left ventricular ejection fraction.
- d) It is the most common view for measuring the left ventricular stroke volume.