



# BRAINWARE UNIVERSITY

**Term End Examination 2021 - 22**

**Programme – Bachelor of Science in Physician Assistant**  
**Course Name – Electrocardiography and Echocardiography**  
**Course Code - BPA404**  
**( Semester IV )**

**Time allotted : 1 Hrs.15 Min.**

**Full Marks : 60**

[The figure in the margin indicates full marks.]

## Group-A

(Multiple Choice Type Question)

1 x 60=60

*Choose the correct alternative from the following :*

- (1) Tall-tented T waves and widened QRS are seen in:
 

a) Hyponatremia	b) Hyperglycemia
c) Hyperkalemia	d) Hyperphosphatemia
- (2) One specific ECG change in hypokalemia (low potassium level) is:
 

a) U wave (a positive deflection after the T wave)	b) ST segment elevation
c) Tall peaked T waves	d) Increased amplitude and widening of the QRS complex
- (3) The depolarization stimulus for the normal heartbeat originates in the:
 

a) Epicardium	b) His-bundle areas
c) Atrioventricular (AV) nodal	d) Sinoatrial (SA) node
- (4) A shortened PR interval, slurring (called a delta wave) of the initial QRS deflection, and prolonged QRS duration are characteristics of:
 

a) Wolff-Parkinson-White (WPW) syndrome	b) Atrial tachycardia
c) Left bundle branch block	d) Myocardial ischemia
- (5) ECG characterized by PR interval which becomes longer with each succeeding ECG complex until there is a P wave not followed by a QRS is seen in:
 

a) First-degree Atrioventricular Block, type II	b) Second-Degree Atrioventricular Block, Type I
c) Second-degree Atrioventricular Block, type II	d) Third-Degree Atrioventricular Block
- (6) Ventricular muscle depolarization is represented by:
 

a) P wave	b) T wave
c) The QRS complex	d) U wave

- (7) The characteristics of normal sinus rhythm include all the following, except:
- a) Rate: 60 to 100 beats/min
  - b) Rhythm: Regular
  - c) P waves: Precede every QRS complex and are consistent in shape
  - d) QRS complex: 0.4 to 0.8 second
- (8) Normal QRS width is:
- a) 0.04 to 0.10 second
  - b) 0.12 to 0.20 second
  - c) 0.42 to 0.43 second
  - d) 0.08-0.12 seconds
- (9) P wave represents:
- a) Depolarization of right ventricle
  - b) Depolarization of both atria
  - c) Depolarization of left ventricle
  - d) Atria to ventricular conduction time
- (10) Identify the rhythm.
- a) Bradycardia
  - b) Normal EEG
  - c) Tachycardia
  - d) First degree heart block
- (11) In ECG relaxation of ventricles is represented by?
- a) P-wave
  - b) T wave
  - c) U wave
  - d) QRS complex
- (12) Which of the following statement is NOT true?
- a) P wave indicate atrial contraction
  - b) depressed ST segment indicate hyperkalemia
  - c) T wave represents ventricular repolarization
  - d) QRS complex represents ventricular depolarization
- (13) ECG was first developed by?
- a) Steward
  - b) William Einthoven
  - c) Koch
  - d) Hubbert Mann
- (14) Comment about the axis:
- a) Right axis deviation
  - b) Left axis deviation
  - c) Normal axis
  - d) Indeterminant axis
- (15) Comment about the axis of the following ECG
- a) RAD
  - b) LAD
  - c) Normal axis
  - d) Indeterminant axis
- (16) Comment RATE of the ECG
- a) 44 bpm
  - b) 110 bpm
  - c) 120 bpm
  - d) Cannot be determined
- (17) Comment on the ECG
- a) AMI
  - b) Ist degree gear Block
  - c) Complete heart block
  - d) 2nd degree heart block
- (18) Tall peaked P wave as demonstrated below is seen in
- a) Pulmonary hypertension
  - b) Ist degree gear Block
  - c) Complete heart block
  - d) 2nd degree heart block
- (19) What does the arrow indicate?
- a) U wave
  - b) T wave
  - c) Inverted P wave
  - d) Inverted T wave
- (20) This is the classic ECG change in MI (Myocardial Infarction)

- a) ST-segment elevation  
b) T-wave inversion  
c) Development of an abnormal Q wave  
d) All of these
- (21) In which of these conditions can widened QRS and Tall-tented T waves be observed  
a) Hyponatremia  
b) Hyperkalemia  
c) Hyperglycemia  
d) Hyperphosphatemia
- (22) ECG identified by the PR interval tends to become longer with every succeeding ECG complex until there is a P wave not followed by a QRS is observed in  
a) Third-Degree Atrioventricular Block  
b) second-Degree Atrioventricular Block, Type II  
c) Second-Degree Atrioventricular Block, Type I  
d) First-Degree Atrioventricular Block, Type II
- (23) A particular ECG change observed in Hypokalemia is  
a) ST segment elevation  
b) U wave, which is a position deflection after the T wave  
c) Tall peaked T waves  
d) Widening of the QRS complex and increased amplitude
- (24) Echocardiography is essentially  
a) ultrasound of the heart  
b) echoing sound of the heart  
c) another name for a treadmill test  
d) recording of heart sounds
- (25) The speed of sound in tissues is:  
a) Roughly 1540 m/s  
b) Roughly 1540 km/s  
c) Roughly 1540 cm/s  
d) Roughly 1540 m/min
- (26) The relationship between propagation speed, frequency, and wavelength is given by the formula:  
a) Propagation speed = frequency  $\times$  wavelength  
b) Propagation speed = wavelength/frequency  
c) Propagation speed = frequency/wavelength  
d) Propagation speed = wavelength  $\times$  period
- (27) The frame rate increases with:  
a) Increasing the depth  
b) Reducing sector angle  
c) Increasing line density  
d) Adding color Doppler to B-mode imaging
- (28) Period is a measure of:  
a) Duration of one wavelength  
b) Duration of half a wavelength  
c) Amplitude of the wave  
d) None of these
- (29) Determination of regurgitant orifice area by the proximal isovelocity surface area (PISA) method is based on:  
a) Law of conservation of mass  
b) Law of conservation of energy  
c) Law of conservation of momentum  
d) Jet momentum analysis Echocardiography
- (30) In which situation can you not use the simplified Bernoulli equation to derive the pressure gradient?  
a) Peak instantaneous gradient across a nonobstructed mitral valve  
b) Peak gradient across a severely stenotic aortic valve  
c) Mean gradient across a severely stenotic aortic valve  
d) Mean gradient across a stenotic tricuspid valve
- (31) Which of the following resolutions change with increasing field depth?  
a) Axial resolution  
b) Lateral resolution  
c) All of these  
d) None of these
- (32) With a fixed-focus transducer with crystal diameter 20 mm and wavelength 2.5 mm, what

is the depth of the focus?

- a) 40 m
- b) 30 mm
- c) 40 mm
- d) 4 m

(33) A sonographer adjusts the ultrasound machine to double the depth of view from 5 to 10 cm. If sector angle is reduced to keep the frame rate constant, which of the following has changed?

- a) Axial resolution
- b) Temporal resolution
- c) Lateral resolution
- d) The wavelength

(34) Which of the following properties of a reflected wave is most important in the genesis of a two-dimensional image?

- a) Amplitude
- b) Period
- c) Pulse repetition period
- d) Pulse duration

(35) Increasing depth will change all of the following except:

- a) Pulse duration
- b) Pulse repetition period
- c) Pulse repetition frequency
- d) Duty factor

(36) The two-dimensional images are produced because of this phenomenon when the ultrasound reaches the tissue:

- a) Refraction
- b) Backscatter
- c) Specular reflection
- d) Transmission

(37) Attenuation of ultrasound as it travels through tissue is higher at:

- a) Greater depth
- b) Lower transducer frequency
- c) Blood rather than soft tissue like muscle
- d) Bone more than air

(38) The half-intensity depth is a measure of:

- a) Ultrasound attenuation in tissue
- b) Half the wall thickness in mm
- c) Coating on the surface of the transducer
- d) Half the ultrasound beam width

(39) What is the highest pulse repetition frequency (PRF) of a 3 MHz pulsed wave transducer imaging at a depth of 7 cm?

- a) 21 000 Hz
- b) 2 333 Hz
- c) 11 000 Hz
- d) 2.1 million Hz

(40) Examples of continuous wave imaging include:

- a) Two-dimensional image
- b) Volumetric scanner-acquired LV image
- c) Color flow imaging
- d) Nonimaging Doppler probe (Pedoff)

(41) Which of the following manipulations will increase the frame rate?

- a) Increase depth
- b) Increase transmit frequency
- c) Decrease sector angle
- d) Increase transmit power

(42) The lateral resolution increases with:

- a) Decreasing transducer diameter
- b) Reducing power
- c) Beam focusing
- d) Reducing transmit frequency

(43) Type of sound used in medical imaging is:

- a) Ultrasound
- b) Infrasound
- c) Audible sound
- d) None of these

(44) Which mode is used for cardiac imaging?

- a) A – Mode
- b) B – Mode

- c) M – Mode  
d) 3D – Mode
- (45) Continuous Wave (CW), Pulsed Wave (PW) and Color Flow (CF) are terms used for which kind of ultrasound?  
a) 3D ultrasound  
b) Dynamic Ultrasound  
c) Doppler Ultrasound  
d) Advanced Ultrasound
- (46) Echocardiography can be used for  
a) remove embolus of the heart  
b) correctly locate the blockages in the arteries and veins  
c) assess the baby’s heart, anatomy and function  
d) measure heartbeat
- (47) Which of the following ultrasound techniques gives the best Ultrasound Image of the heart?  
a) 2D phased array  
b) Linear phased array  
c) Transesophageal  
d) Curvilinear array
- (48) Which of the following on a color Doppler display is represented in real time?  
a) Gray-scale anatomy  
b) Flow direction  
c) Doppler spectrum  
d) Gray-scale anatomy and flow direction
- (49) Two identical structures appear on an ultrasound scan. One is real and the other is an artifact, the artifact being deeper than the real structure. What is this artifact called?  
a) Shadowing  
b) Ghosting  
c) Speed error artifact  
d) Mirror image
- (50) Myocardial Infarction in ecg is diagnosed by:  
a) Tall T waves  
b) ST segment elevation  
c) Wide QRS complex  
d) Abnormal P wave
- (51) “P” wave in ecg represents:  
a) Depolarisation of SA node  
b) Ventricular depolarisation  
c) Atrial depolarisation  
d) None of these
- (52) “T” wave represents:  
a) Ventricular repolarization  
b) Atrial repolarization  
c) Sclerotic changes in Purkinje fibres  
d) None of these
- (53) True about Atrial fibrillation  
a) Regularly irregular rhythm  
b) P waves are absent  
c) Slow ventricular rate is seen  
d) AV node is not refractory
- (54) Inferior wall of heart is represented in ecg by which combination of leads?  
a) II,III,aVf  
b) V1,V2,V3  
c) V1,V3,V6  
d) None of these
- (55) A patient is diagnosed with anterior wall STEMI. Which leads will have a ST elevation?  
a) V3,V4  
b) V1,V2  
c) II,III  
d) aVF
- (56) False statement about ecg of tetralogy of fallot  
a) Absent P waves in V1  
b) Upright T wave in V1  
c) Both a & b  
d) None of these
- (57) False about ecg of mitral stenosis is  
a) ECG is normal early on in the disease  
b) Right axis deviation

c) P mitrale is seen

d) P mitrale will be seen even if patient develops atrial fibrillation

(58) True about myocardial infarction

a) NSTEMI causes no ST elevation in ECG

b) STEMI causes no sr elevation in ecg

c) Streptokinase causes better revascularisation than primary PTCA

d) Q wave suggests a new infarct

(59) The following can result in a poor echo window

a) Lean patient

b) Obese patient

c) Obtunded patient

d) Unconscious patient

(60) Echocardiography uses

a) Xray

b) Gamma Rays

c) Ultrasonic waves

d) Alpha rays