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TSPSC

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Previous Year Paper
(Biomedical Engg.)
08 Sept, 2023 Shift 2



TCSiON CAE

Notations :

- 1.Options shown in **green** color and with  icon are correct.
- 2.Options shown in **red** color and with  icon are incorrect.

Question Paper Name :

BioMedical 0809S2

Subject Name :

PC222021 BIO MEDICAL ENGINEERING PL2220

Actual Answer Key :

Yes

Calculator :

None

Magnifying Glass Required? :

No

Ruler Required? :

No

Eraser Required? :

No

Scratch Pad Required? :

No

Rough Sketch/Notepad Required? :

No

Protractor Required? :

No

Show Watermark on Console? :

Yes

Highlighter :

No

Auto Save on Console?

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :

No

Help Button :

No

Show Reports :

No

Show Progress Bar :

No

Is this Group for Examiner? :

No

Examiner permission :

Cant View

Show Progress Bar? :

No

BIO MEDICAL ENGINEERING

Section type :

Online

Section Negative Marks :

0

Enable Mark as Answered Mark for Review and Clear Response :

Yes

Maximum Instruction Time :

0

Is Section Default? :

null

Question Number : 1 Question Id : 630680354221 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components used in Impedance pneumography from first to last.

P. 50 KHz oscillator

Q. Demodulator and filter

R. Recorder

Options :

1.  P, Q, R

2. ✘ P, R, Q

3. ✘ Q, P, R

4. ✘ R, P, Q

Question Number : 2 Question Id : 630680354222 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The impedance pneumography is an indirect technique for the measurement of _____.

Options :

1. ✓ Respiration

2. ✘ Blood flow

3. ✘ Temperature

4. ✘ Pulse rate

Question Number : 3 Question Id : 630680354223 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A device which is placed directly in the airway to measure the velocity of air flow is known as _____.

Options :

1. ✘ Spirometer

2. ✓ Pneumotachograph

3. ✘ EEG

4. ✘ ECG

Question Number : 4 Question Id : 630680354224 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair is correct regarding the measurements through pneumotachograph?

I. Volume per breath – The integral of the velocity time record during inspiration

II. Volume per breath – The integral of the velocity time record during expiration

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ❌ Neither I nor II

Question Number : 5 Question Id : 630680354225 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding ventilators?

- I. When artificial ventilation needs to be maintained for a long time, a ventilator is used.
- II. Ventilators are also used during anaesthesia and are designed to match human breathing pattern.
- III. The main function of a ventilator is to ventilate the lungs in a manner as close to natural respiration as possible.

Options :

1. ❌ Only I and II
2. ❌ Only II and III
3. ❌ Only I and III
4. ✓ I, II and III

Question Number : 6 Question Id : 630680354226 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair is correct regarding types of ventilators?

- I. Anesthesia ventilators – Generally small and simple
- II. Intensive care ventilators – More complicated than anesthesia ventilators

Options :

1. ❌ Only I
2. ❌ Only II
3. ✓ Both I and II
4. ❌ Neither I nor II

Question Number : 7 Question Id : 630680354227 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The highest level of pressure reached over several breaths in ventilation is known as _____.

Options :

1. ❌ Bias flow
2. ❌ Sigh volume

3. Peak airway pressure

4. Respiration rate

Question Number : 8 Question Id : 630680354228 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Tidal volume is the depth of breathing during each respiratory cycle. For a constant inspiratory time, arrange the following readings with different flow rates, in the increasing order of their tidal volume.

P. flow rate = 0.6 L/s

Q. flow rate = 0.8 L/s

R. flow rate = 1 L/s

Options :

1. P, Q, R

2. P, R, Q

3. Q, P, R

4. Q, R, P

Question Number : 9 Question Id : 630680354229 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the full form of PEEP?

Options :

1. Positive End Expiratory Pressure

2. Proton Emitter Enhancement Pressure

3. Pre-Set End Enhancement Pressure

4. Pressure Exciter End Potential

Question Number : 10 Question Id : 630680354230 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding Humidifiers?

I. The main task of a humidifier is to replace humidity in the upper air passages which has been lost by intubation.

II. The humidity should be as close to 100 percent as possible.

Options :

1. Only I

2. ✘ Only II
3. ✓ Both I and II
4. ✘ Neither I nor II

Question Number : 11 Question Id : 630680354231 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

Match the following amplifiers to their correct description.

	Amplifier		Description
I	Differential	1	Reject any common mode signal that appears simultaneously at both amplifier input terminals and amplifies only the voltage difference that appears across its input terminals
II	Carrier	2	Used with transducers which require an external source of excitation
III	DC amplifier	3	Generally, of the negative feedback type and used for medium gain application

Options :

1. ✓ I-1, II-2, III-3
2. ✘ I-2, II-1, III-3
3. ✘ I-2, II-3, III-1
4. ✘ I-3, II-2, III-1

Question Number : 12 Question Id : 630680354232 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components of a basic audiometer from top to bottom.

P. Oscillator
 Q. Attenuator
 R. Power amplifier

Options :

1. ✓ P, Q, R
2. ✘ P, R, Q
3. ✘ Q, P, R
4. ✘ Q, R, P

Question Number : 13 Question Id : 630680354233 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding masking in audiology?

- I. Masking efficiency depends upon the nature of masking sound as well as its intensity.
- II. Masking efficiency of a pure tone is low as compared to a noise composed of many frequencies.

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 14 Question Id : 630680354234 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pairs is correct regarding masking in audiology?

- I. White noise – Noise containing all frequencies in the audible spectrum at approximately equal intensities
- II. Narrow-band noise – Most efficient masking noise in pure-tone audiology

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 15 Question Id : 630680354235 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The transmission of sound through the external and middle ear to the internal ear of human is known as _____.

Options :

1. Air conduction
2. Bone conduction
3. Cochlea conduction
4. Acoustic conduction

Question Number : 16 Question Id : 630680354236 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the ultrasonic region, a bone conducted signal of _____ electrical watt is audible.

Options :

1. Less than 1
2. More than 1
3. More than 10
4. More than 12

Question Number : 17 Question Id : 630680354237 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair of type of laser and its wavelength is correct?

- I. Argon – 490 nm
- II. Krypton – 1064 nm

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 18 Question Id : 630680354238 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The laser action depends upon the phenomenon of _____.

Options :

1. Stimulated emissions
2. Stimulated extractions
3. Spontaneous extractions
4. Microwave amplification

Question Number : 19 Question Id : 630680354239 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding origin of human heart sounds?

I. The sounds are produced by the mechanical events that occur during the heart cycle.

II. These sounds can be from the movement of the heart wall, closure of walls.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ✘ Neither I nor II

Question Number : 20 Question Id : 630680354240 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair of heart sound characteristics are correct for the first sound of human heart?

I. Frequency – 30 to 100 Hz

II. Duration – 50 to 100 ms

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ✘ Neither I nor II

Question Number : 21 Question Id : 630680354241 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the components in the block diagram of phonocardiograph from first to last.

P. Pre-amplifier

Q. Notch filter

R. A/D conversion

Options :

1. ✓ P, Q, R

2. ✘ Q, P, R

3. ✘ Q, R, P

4. ✘ P, R, Q

Question Number : 22 Question Id : 630680354242 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

How many types of microphones are commonly used for recording phonocardiograms?

Options :

1. 2

2. 4

3. 6

4. 8

Question Number : 23 Question Id : 630680354243 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The _____ microphone contains a wafer of piezo-electric material, which generates potential when subjected to mechanical stress due to human heart sounds.

Options :

1. Crystal

2. Dynamic

3. Non-contact

4. Inflow

Question Number : 24 Question Id : 630680354244 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components of block diagram of a EMG recording system from the patient side

P. Amplifier

Q. Digital signal processing

R. Display

Options :

1. P, Q, R

2. P, R, Q

3. Q, P, R

4. Q, R, P

Question Number : 25 Question Id : 630680354245 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The input impedance of the amplifier used in EMG must be _____.

Options :

1. less than $1 \times 10 \text{ m}\Omega$

2. less than $2 \times 50 \text{ m}\Omega$

3. more than $2 \times 50 \text{ m}\Omega$

4. less than $2 \times 10 \text{ m}\Omega$

Question Number : 26 Question Id : 630680354246 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair regarding electromagnetic flowmeters is correct?

I. Sine wave flowmeter – The probe magnet is energized with a sine wave and consequently the induced voltage will also be sinusoidal in nature.

II. Square wave flowmeter – The energizing voltage given to the magnet is a square wave.

Options :

1. Only I

2. Only II

3. Both I and II

4. Neither I nor II

Question Number : 27 Question Id : 630680354247 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding direct method of monitoring blood pressure?

I. It is used when the highest degree of absolute accuracy, dynamic response and continuous monitoring are required.

II. It is used to measure the pressure in deep regions inaccessible by indirect means.

III. For direct measurement, a catheter or a needle type probe is inserted through a vein or artery to the area of interest.

Options :

1. Only I and II

2. Only II and III

3. Only I and III

4. I, II and III

Question Number : 28 Question Id : 630680354248 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The fully automatic method for measuring blood pressure which has been developed using the ordinary Riva-Rocci cuff is known as _____.

Options :

1. Rheographic method
2. Differential auscultatory technique
3. Oscillometric measurement method
4. Korotkoff's method

Question Number : 29 Question Id : 630680354249 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the correct expression for doppler frequency? (V_t = velocity of object, λ_c = carrier wavelength)

Options :

$$1. \checkmark \Delta f = \frac{2V_t}{\lambda_c}$$

$$2. \times \Delta f = V_t$$

$$3. \times \Delta f = \frac{\lambda_c}{2V_t}$$

$$4. \times \Delta f = V_t \times \lambda_c$$

Question Number : 30 Question Id : 630680354250 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding properties of X-rays?

I. X-ray are electromagnetic radiation located at the low wavelength end of the electromagnetic spectrum.

II. They have a wavelength of the order 10^{-10} m.

III. They propagate with a speed of 3×10^{10} m/s.

Options :

1. Only I and II
2. Only II and III

3. ❌ Only I and III

4. ✓ I, II and III

Question Number : 31 Question Id : 630680354251 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the components of stationary anode tube used in production of X-rays to their correct material used in formation.

	Component		Material used
I	Cathode block	1	Made from nickel or stainless steel
II	Filament	2	Closely wound helix of tungsten wire
III	Target	3	Small tablet of tungsten soldered into a block of copper

Options :

1. ✓ I-1, II-2, III-3

2. ❌ I-2, II-1, III-3

3. ❌ I-2, II-3, III-1

4. ❌ I-3, II-2, III-1

Question Number : 32 Question Id : 630680354252 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ is placed between the X-ray tube and the patient.

Options :

1. ✓ Collimators

2. ❌ Grid

3. ❌ Spirometer

4. ❌ Flowmeter

Question Number : 33 Question Id : 630680354253 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

How many types of detectors are used in digital radiography ?

Options :

1. ❌ 4

2. ✘ 6

3. ✓ 2

4. ✘ 5

Question Number : 34 Question Id : 630680354254 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement are correct regarding Beer-Lambert law?

- I. It defines the relationship between the concentration of a solution and the amount of light absorbed by the solution.
- II. The absorbance of light depends on the molecules present in a solution.
- III. Absorbance of light is proportional to the concentration of solutes.

Options :

1. ✘ Only I and II

2. ✘ Only II and III

3. ✘ Only I and III

4. ✓ I, II and III

Question Number : 35 Question Id : 630680354255 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following instruments to their correct description.

	Instruments		Description
I	Colorimeter	1	Measurement of colour in the visual region of the electromagnetic spectrum
II	Spectrophotometer	2	Absorption of electromagnetic radiation in the visible, ultraviolet and infrared signal
III	Fluorometer	3	Measures the fluorescence or light emitted by different fluorescing objects

Options :

1. ✓ I-1, II-2, III-3

2. ✘ I-2, II-1, III-3

3. ✘ I-2, II-3, III-1

4. ✘ I-3, II-2, III-1

Question Number : 36 Question Id : 630680354256 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding colorimeter?

- I. They are extremely simple in construction and operation.
- II. The disadvantage of colorimeter is that a range of filters is required to cover different wavelength regions.

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 37 Question Id : 630680354257 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the frequency range of X-rays?

Options :

1. $10^{13} - 10^{11}$ Hz
2. $10^{19} - 10^{17}$ Hz
3. $10^4 - 10^2$ Hz
4. $10^9 - 10^7$ Hz

Question Number : 38 Question Id : 630680354258 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Visible light represents only a very small portion of the electromagnetic spectrum and generally covers a range from _____.

Options :

1. 100 – 200 nm
2. 990 – 1290 nm
3. 380 – 780 nm
4. 50 – 70 nm

Question Number : 39 Question Id : 630680354259 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement are correct regarding precautions to minimize electric hazards?

- I. Provide isolated input circuits on monitoring equipment.
- II. Have periodic checks of ground wire continuity of all equipment.
- III. In the vicinity of the patient, use only apparatus or appliances with three wire power cords.

Options :

1. ✘ Only I and II
2. ✘ Only II and III
3. ✘ Only I and III
4. ✓ I, II and III

Question Number : 40 Question Id : 630680354260 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Based on the IEC document, the Bureau of Indian Standards (BIS) has issued the IS : 8607 standard to cover general and safety requirement of electromedical equipment. The standard issued has _____ parts.

Options :

1. ✘ 2
2. ✘ 4
3. ✘ 6
4. ✓ 8

Question Number : 41 Question Id : 630680354261 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The IEC recommendation covering the safety aspects of electrical equipment for medical application stipulate that the current that flows continuously through the heart shall not exceed _____ for a frequency range of 0 to 1 KHz.

Options :

1. ✘ 50 A
2. ✘ 50 μ A
3. ✘ 10 A
4. ✓ 10 μ A

Question Number : 42 Question Id : 630680354262 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding leakage current?

- I. The major source of potentially lethal currents in any instruments or equipment is the leakage current.
- II. It is an inherent flow of non-functional current from the live electrical parts of an instrument to the accessible metal parts.

Options :

1. ✘ Only I
2. ✘ Only II
3. ✓ Both I and II
4. ✘ Neither I nor II

Question Number : 43 Question Id : 630680354263 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the frequency range of microwaves?

Options :

1. ✘ 30 – 150 MHz
2. ✓ 300 – 30000 MHz
3. ✘ 40000 – 50000 MHz
4. ✘ 5 – 20 MHz

Question Number : 44 Question Id : 630680354264 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The current which flows, in normal condition from the enclosure or part of the enclosure through a person in contact with an accessible part of the enclosure to earth is known as _____.

Options :

1. ✘ Earth leakage current
2. ✘ Patient leakage current
3. ✓ Enclosure leakage current
4. ✘ Macroshock leakage current

Question Number : 45 Question Id : 630680354265 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding MRI?

- I. MRI is a clinically important medical imaging modality due to its exceptional soft tissue contrast.
- II. MRI research involves fundamental tradeoff's between resolution, imaging time, and signal to noise ratio.
- III. MRI depends heavily on both gradient and receiver coil hardware innovations.

Options :

1. ✘ Only I and II
2. ✘ Only II and III
3. ✘ Only I and III
4. ✓ I, II and III

Question Number : 46 Question Id : 630680354266 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the full form of NMR?

Options :

1. ✓ Nuclear Magnetic Resonance
2. ✘ Negative Magnetic Resonance
3. ✘ Non-linear Magnetic Resonance
4. ✘ Non-invasive Multilinear Resonance

Question Number : 47 Question Id : 630680354267 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a part of MRI scanner?

Options :

1. ✘ Pulse generator
2. ✘ Display
3. ✓ Relay
4. ✘ Data acquisition

Question Number : 48 Question Id : 630680354268 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding magnets used in MRI?

I. In a permanent magnet, the patient is placed in the gap between a pair of permanently magnetized pole faces.

II. In electromagnet the pole faces are made of soft magnetic material.

Options :

1.  Only I

2.  Only II

3.  Both I and II

4.  Neither I nor II

Question Number : 49 Question Id : 630680354269 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding computed Tomography?

I. In CT, the picture is made by viewing the patient via X-ray imaging from numerous angles.

II. With CT images radiologists could easily visualize the ventricles of the brain and repositories of the cerebrospinal fluid.

III. CT involves the determination of attenuation characteristic for each small volume of tissue in the patient slice.

Options :

1.  Only I and II

2.  Only II and III

3.  Only I and III

4.  I, II and III

Question Number : 50 Question Id : 630680354270 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which subsystem takes suitable readings for a picture to be reconstructed and includes X-ray source and detectors?

Options :

1.  Scanning system

2.  Processing unit

3.  Viewing part

4.  Storage unit

Question Number : 51 Question Id : 630680354271 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following processing system to their correct characteristic in the context of Computer Tomography.

	Processing system		Characteristics
I	Data-acquisition system	1	Consist of pre-amplifiers, current to voltage converter, multiplexer and analog to digital converters
II	Processing unit	2	Reconstructing pictures from the information received by the computer
III	Computer system	3	Image computation and formation

Options :

1. I-1, II-2, III-3
2. I-2, II-1, III-3
3. I-2, II-3, III-1
4. I-3, II-2, III-1

Question Number : 52 Question Id : 630680354272 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding detectors in CT?

- I. The detectors used in CT systems must have a high overall efficiency to minimize the patient radiation dose.
- II. The detectors must be stable with time and insensitive to temperature variations within the gantry.

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 53 Question Id : 630680354273 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The half-life of a radioactive isotope is given by _____.

Options :

1. $t^{1/2} = 0.693/\lambda$ 2. $t^{1/2} = \lambda/0.693$ 3. $t^{1/2} = 0.963/\lambda$ 4. $t^{1/2} = \lambda/0.963$

Question Number : 54 Question Id : 630680354274 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the unit of Radioactivity?

Options :

1. Plank2. Henry3. Ohm4. Curie

Question Number : 55 Question Id : 630680354275 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding positron emission tomography (PET)?

I. It is an imaging modality for obtaining in vivo cross-sectional images of positron-emitting isotopes that demonstrate biological function, physiology or pathology.

II. PET imaging provides “functional” information about the human body.

Options :

1. Only I2. Only II3. Both I and II4. Neither I nor II

Question Number : 56 Question Id : 630680354276 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In PET, to facilitate replacement, the detectors are arranged in modules or buckets containing _____ detector packages.

Options :

1. 4

2. ✘ 8

3. ✓ 16

4. ✘ 20

Question Number : 57 Question Id : 630680354277 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

The original PET scanners were constructed using _____ detectors.

Options :

1. ✓ NaI (TI)

2. ✘ CdTe

3. ✘ NaOH

4. ✘ CdZnTe

Question Number : 58 Question Id : 630680354278 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a component of defibrillator circuit diagram?

Options :

1. ✘ Auto-transformer

2. ✘ Step-up transformer

3. ✘ 230 V source

4. ✓ Multiplexer

Question Number : 59 Question Id : 630680354279 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A small match box sized device that can be implanted in the chest or abdomen and constantly monitor the heart rhythms is known as Implantable _____.

Options :

1. ✘ Spirometer

2. ✘ Oxygenator

3. ✘ Patient Monitoring system

4. ✓ Defibrillator

Question Number : 60 Question Id : 630680354280 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The weight of cardioverter-defibrillator generally varies from _____.

Options :

1. 50 – 120 gms
2. 5 – 12 gms
3. 15 – 25 gms
4. 190 – 230 gms

Question Number : 61 Question Id : 630680354281 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ amplifiers are also known as bio-potential amplifier.

Options :

1. Differential
2. A.C coupled
3. Carrier
4. D.C

Question Number : 62 Question Id : 630680354282 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair is correct regarding amplifier?

- I. Differential – Used for measuring bio-electric signal
- II. Carrier – Characterized by high-gain, negligible drift extremely low noise

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 63 Question Id : 630680354283 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following parts of basic electronic recording system from first to last.

P. Electrodes Transducer

Q. Signal conditioning

R. Writing system

Options :

1. P, Q, R

2. R, P, Q

3. R, Q, P

4. Q, P, R

Question Number : 64 Question Id : 630680354284 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding ink-jet recorder?

I. The technique consists of very fine jet of ink, which replaces the light beam of a photographic recorder or the stylus of a direct recorder.

II. The inherent high frequency response of the jet recording system is due to the significant reduction in the inert mass of the moving assembly.

III. It provides an economic recording method, particularly for multichannel applications.

Options :

1. Only I and II

2. Only II and III

3. Only I and III

4. I, II and III

Question Number : 65 Question Id : 630680354285 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The ink-jet recorder method is usable upto frequencies of about _____ Hz.

Options :

1. 1000

2. 100

3. 10

4. ✘ 150

Question Number : 66 Question Id : 630680354286 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding bedside patient monitoring system?

I. They are designed to monitor different parameters but the common feature is to monitor and display ECG waveform and heart rate.

II. They also include pulse, pressure, temperature and respiration rate monitoring facilities.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ✘ Neither I nor II

Question Number : 67 Question Id : 630680354287 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The cessation of breathing which may precede the arrest of the heart and circulation in several clinical situation such as head injury and drug overdose is known as _____

Options :

1. ✓ Apnoea

2. ✘ Anorexia

3. ✘ Asthma

4. ✘ Aphasia

Question Number : 68 Question Id : 630680354288 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT an application of Nernst equation?

Options :

1. ✘ Determination of equilibrium constant

2. ✘ Determination of pH value of a solution

3. ✘ Determination of cell emf under non-standard conditions

4. ✓ Determination of capacitance of the cell

Question Number : 69 Question Id : 630680354289 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The energy associated with the action potential is developed from metabolic processes within the cell which take time for completion. This period is known as _____.

Options :

1. Refractory period

2. Axon period

3. Stimulus period

4. Receptor period

Question Number : 70 Question Id : 630680354290 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

An instrument for recording the electrical activity of the human brain, by suitably placing electrodes on the scalp is known as _____.

Options :

1. EEG

2. ECG

3. EMG

4. Defibrillator

Question Number : 71 Question Id : 630680354291 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

An instrument used for recording the electrical activity of the human muscles to determine whether the muscle is contracting or not is known as Electro_____.

Options :

1. Encephalograph

2. cardiograph

3. Myograph

4. Oculograph

Question Number : 72 Question Id : 630680354292 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In ECG, the diagnostically useful frequency range is usually accepted as _____.

Options :

1. ❌ 50 – 150 KHz

2. ✓ 0.05 – 150 Hz

3. ❌ 0.02 – 0.03 Hz

4. ❌ 5 – 10 KHz

Question Number : 73 Question Id : 630680354293 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding ECG?

I. It is an instrument which records the electrical activity of the human heart

II. ECG stands for Electro-cardiograph

III. ECG provides valuable information about a wide range of cardiac disorder such as presence of an inactive part or an enlargement of the heart muscle

Options :

1. ❌ Only I and II

2. ❌ Only II and III

3. ❌ Only I and III

4. ✓ I, II and III

Question Number : 74 Question Id : 630680354294 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components of a EEG machine from first to last.

P. Patient

Q. Writer Unit

R. Amplifiers

Options :

1. ✓ P, R, Q

2. ❌ R, P, Q

3. ❌ R, Q, P

4. ❌ P, Q, R

Question Number : 75 Question Id : 630680354295 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The general resistance – temperature relation for a thermistor is given by _____.

(R = Resistance of the thermistor, T = Absolute Temperature, A and B = Constants)

Options :

1. $R = Ae^{B/T}$

2. $R = e^T$

3. $R = \frac{1}{Ae^{B/T}}$

4. $R = T(e^B)$

Question Number : 76 Question Id : 630680354296 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT an advantage thermistor have over thermocouple?

Options :

1. Low sensitivity

2. Small in size

3. They can be had in a variety of shapes making them suitable for all types of application

4. Measurements can be taken rather quickly

Question Number : 77 Question Id : 630680354297 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The most commonly used microwave wavelength for therapeutic heating is 2450 MHz corresponding to a wavelength of _____.

Options :

1. 2 cm

2. 8 cm

3. 12.25 cm

4. 15.98 cm

Question Number : 78 Question Id : 630680354298 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding Piezoelectric transducer?

I. Piezo-electric materials have a high resistance.

II. The input impedance of the voltage measuring device must be higher than that of piezo-electric sensor.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ✘ Neither I nor II

Question Number : 79 Question Id : 630680354299 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following transducer to their correct description.

	Transducer		Description
I	LVDT	1	Can be conveniently used for the measurement of physiological pressures
II	Piezo-electric	2	Based on the property of natural crystalline substances to develop electric potential
III	Pyroelectric	3	Uses electric charge that is a function of its temperature gradient

Options :

1. ✓ I-1, II-2, III-3

2. ✘ I-2, II-1, III-3

3. ✘ I-2, II-3, III-1

4. ✘ I-3, II-2, III-1

Question Number : 80 Question Id : 630680354300 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Single beam spectrophotometer use _____ cuvette holder at a time.

Options :

1. ✘ 2

2. ✘ 4

3. ✘ 6

4. ✓ 1

Question Number : 81 Question Id : 630680354301 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For operation on ultraviolet light the spectrophotometer are fitted with _____.

Options :

1. ✓ Hydrogen lamp

2. ✘ Tungsten lamp

3. ✘ Sodium lamp

4. ✘ Carbon lamp

Question Number : 82 Question Id : 630680354302 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the wavelength of visible range used in colorimeter?

Options :

1. ✘ 40 – 70 nm

2. ✓ 400 – 700 nm

3. ✘ 4000 – 7000 nm

4. ✘ 180 – 200 nm

Question Number : 83 Question Id : 630680354303 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding LASER?

I. The high radiance, monochromaticity and spacial and temporal coherence makes the laser unique light-probe for non-invasive application.

II. The medical use of lasers is suitable where there is a favourable interaction between the laser radiation and the human tissues.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ❌ Neither I nor II

Question Number : 84 Question Id : 630680354304 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following instruments to their correct description.

	Instrument		Description
I	ECG	1	Measure electrical activity of human brain
II	EMG	2	Measure electrical activity of human heart
III	EEG	3	Measure electrical activity of the human muscle

Options :

1. ❌ I-1, II-2, III-3
 2. ❌ I-2, II-1, III-3
 3. ✓ I-2, II-3, III-1
 4. ❌ I-3, II-2, III-1

Question Number : 85 Question Id : 630680354305 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components of as per the block diagram of external pacemaker in the correct order from first to last.

P. Power supply

Q. Pulse output circuit

R. Electrodes

Options :

1. ✓ P, Q, R
 2. ❌ R, Q, P
 3. ❌ R, P, Q
 4. ❌ Q, R, P

Question Number : 86 Question Id : 630680354306 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In single-chamber pacemaker how many wires are placed into the chamber of the human heart?

Options :

1. 1

2. 2

3. 4

4. 6

Question Number : 87 Question Id : 630680354307 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The threshold detector in synchronous demand pacemaker are designed to operate with a detection sensitivity _____.

Options :

1. 10 – 20 mV

2. 1 – 2 mV

3. 40 – 50 mV

4. 55 – 65 mV

Question Number : 88 Question Id : 630680354308 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding the conditions where external pacemakers are used?

I. In case of cardiac standstill

II. While the patient is in intensive care unit

III. While the patient is awaiting implantation of a permanent pacemaker

Options :

1. Only I and II

2. Only II and III

3. Only I and III

4. I, II and III

Question Number : 89 Question Id : 630680354309 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following types of pacemaker to their correct description.

	Instrument		Description
I	External	1	Employed to restart the normal rhythm of the heart in case of cardiac standstill in situation where short term pacing is considered adequate
II	Implantable	2	Power source should be in a position to supply sufficient power to the circuit over prolonged periods of time;
III	Synchronous demand pacemaker	3	Consist of pulse generator, having two functions pacing and sensing

Options :

1. I-1, II-2, III-3
2. I-2, II-1, III-3
3. I-2, II-3, III-1
4. I-3, II-1, III-2

Question Number : 90 Question Id : 630680354310 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following component of a ventricular synchronous demand pacemaker in the correct order from first to last.

P. QRS bandpass filter

Q. Threshold detector

R. Free running oscillator

Options :

1. P, Q, R
2. Q, P, R
3. Q, R, P
4. R, P, Q

Question Number : 91 Question Id : 630680354311 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following components of an ultrasonic diathermy in correct order from first to last?

- P. Mains voltage
- Q. Power and voltage control
- R. Power amplifier

Options :

1. P, Q, R
2. Q, P, R
3. Q, R, P
4. R, P, Q

Question Number : 92 Question Id : 630680354312 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement correct regarding infrared thermography?

- I. IRT can map body surface temperature remotely.
- II. IRT has been successfully used in diagnosis of breast cancer, diabetes neuropathy and peripheral vascular disorder.

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 93 Question Id : 630680354313 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a characteristic of IRT?

Options :

1. Fast
2. Non-contact
3. Invasive
4. Passive

Question Number : 94 Question Id : 630680354314 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is incorrect regarding implantable defibrillators?

Options :

1. Hermetically sealed
2. Bio-compatible
3. Cannot survive 500 G's over a temperature range of -30°C to 60°C
4. Small match box sized

Question Number : 95 Question Id : 630680354315 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**Correct Marks : 2 Wrong Marks : 0**

Which of the following statement is correct regarding the Purkinje fibres?

- I. They play a major role in electrical conduction and propagation of impulse to the ventricular muscle.
- II. Conduction velocity in the Purkinje fibres is about 1.5 to 2.5 m/s.

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 96 Question Id : 630680354316 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**Correct Marks : 2 Wrong Marks : 0**

In the context of Bipolar ECG leads, in standard lead I the electrodes are placed on the _____.

Options :

1. right leg and left leg
2. right arm and left leg
3. right arm and left arm
4. left arm and left leg

Question Number : 97 Question Id : 630680354317 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**Correct Marks : 2 Wrong Marks : 0**

In the context of ECG leads, the precordial leads are designated by the capital letter _____ followed by a subscript numeral.

Options :

1. ✘ A

2. ✘ M

3. ✘ K

4. ✓ V

Question Number : 98 Question Id : 630680354318 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following unipolar ECG leads are also called augmented leads or averaging leads?

Options :

1. ✓ Limb leads

2. ✘ Precordial leads

3. ✘ Einthoven leads

4. ✘ Power leads

Question Number : 99 Question Id : 630680354319 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding the membrane oxygenators in cardiopulmonary bypass?

I. They consist of hollow microporous polypropylene fibres.

II. They have lesser propensity for air embolism.

III. They give greater accuracy in blood gas control.

Options :

1. ✘ Only I and II

2. ✘ Only II and III

3. ✘ Only I and III

4. ✓ I, II and III

Question Number : 100 Question Id : 630680354320 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the conduct of Cardiopulmonary Bypass (CPB), how do we calculate the Target Hematocrit (Hct) on CPB? (TCV = Total circulating volume, PCV = Patients blood volume)

Options :

1. ✓ $(PCV \times HCT)/TCV$

2. ✘ (PCV + HCT)/TCV

3. ✘ (PCV – HCT)/TCV

4. ✘ PCV + HCT + TCV

Question Number : 101 Question Id : 630680354321 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which part of Cardiopulmonary Bypass (CPB) circuit connect the patient to the circuit and hence to the CPB machine?

Options :

1. ✓ Cannulae

2. ✘ Oxygenator

3. ✘ Pump

4. ✘ Reservoir

Question Number : 102 Question Id : 630680354322 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The first biological valves implanted were homografts with valves explanted from cadavers _____ after death.

Options :

1. ✘ within 144 hours

2. ✘ within 96 hours

3. ✓ within 48 hours

4. ✘ within 168 hours

Question Number : 103 Question Id : 630680354323 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding the mechanical heart valves?

I. The initial designs of mechanical valves were of centrally occluding caged ball or caged disc type.

II. The initial design of tilting disc valves consisted of a polyacetal disc with a Teflon sewing ring.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ❌ Neither I nor II

Question Number : 104 Question Id : 630680354324 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Bi-leaflet heart valves consist of how many semicircular leaflets?

Options :

1. ❌ Five

2. ❌ Nine

3. ✓ Two

4. ❌ Seven

Question Number : 105 Question Id : 630680354325 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ valve is the one transplanted from a human donor.

Options :

1. ✓ Homograft

2. ❌ Autograft

3. ❌ Autologous

4. ❌ Xenograft

Question Number : 106 Question Id : 630680354326 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following in the context of use of Biomaterials.

	Problem area		Biomaterial
I	Replacement of diseased or damaged part	1	Artificial hip joint
II	Assist in healing	2	Sutures
III	Improve function	3	Cardiac pacemaker

Options :

1. ❌ I-2, II-1, III-3

2. ❌ I-2, II-3, III-1

3. ✓ I-1, II-2, III-3

4. ❌ I-3, II-1, III-2

Question Number : 107 Question Id : 630680354327 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the composition of the following elements in the context of composition (in percentage) of 316 L stainless steel in the increasing order.

P. Carbon

Q. Molybdenum

R. Chromium

Options :

1. ✓ P, Q, R

2. ❌ Q, R, P

3. ❌ Q, P, R

4. ❌ R, P, Q

Question Number : 108 Question Id : 630680354328 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Elastomers are used for which of the following applications in Dentistry?

Options :

1. ✓ Impression materials

2. ❌ Dental porcelain

3. ❌ Dental cements

4. ❌ Orthodontic wires

Question Number : 109 Question Id : 630680354329 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are the Dental Implant Materials?

I. Metals

II. Ceramics

III. Polymers and Composites

Options :

1. ❌ Only I and II

2. ❌ Only II and III

3. ❌ Only I and III

4. ✓ I, II and III

Question Number : 110 Question Id : 630680354330 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following ceramics used in the orthopedic applications in the decreasing order of their 'Elastic modulus, GPa'.

P. Bioglass

Q. Alumina

R. Dense calcium phosphate

Options :

1. ❌ R, P, Q

2. ✓ Q, R, P

3. ❌ R, Q, P

4. ❌ P, Q, R

Question Number : 111 Question Id : 630680354331 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

PMMA is the polymer used to replace or augment bone itself. What is the full form of PMMA?

Options :

1. ✓ Poly-Methylmethacrylate

2. ❌ Poly-Methylmangacecylate

3. ❌ Peptide-Mangeneaseacrylate

4. ❌ Peptide-Methylmethacrylate

Question Number : 112 Question Id : 630680354332 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following combination of synthetic polymer and its biomedical application is NOT correct?

Options :

1. ❌ PVC : Dialysis devices

2. PP : Disposable syringes

3. PU : Tubing

4. Nylon : Reservoir

Question Number : 113 Question Id : 630680354333 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding cochlear microphonic?

- I. It has been obtained in humans by recording intra-tympanic or extra-tympanic electrocochleography.
- II. It is a receptor potential believed to be generated primarily by outer hair cells.

Options :

1. Only I

2. Only II

3. Both I and II

4. Neither I nor II

Question Number : 114 Question Id : 630680354334 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of middle ear of human, how many bones transfer sound from the tympanic membrane to the oval window?

Options :

1. Nine

2. Ten

3. Seven

4. Three

Question Number : 115 Question Id : 630680354335 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following electrosurgical output systems are recommended by IEC (1978)?

I. Earth-referenced

II. Isolated

Options :

1. Only I

2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 116 Question Id : 630680354336 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

Which of the following pair is correct regarding the current wave forms in electrosurgery?

- I. Coagulation wave form – Continuous, unmodulated and undamped current
- II. Pure cutting waveform – Interrupted, modulated and damped current

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 117 Question Id : 630680354337 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a safety measure for prevention of electrosurgical complications?

Options :

1. Use the lowest possible power setting
2. Do not select an all-metal cannula system as the safest choice
3. Use brief intermittent activation
4. Use a low voltage waveform [cut]

Question Number : 118 Question Id : 630680354338 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 2 Wrong Marks : 0

In bipolar electrosurgery _____ are performed at the site of surgery.

Options :

1. Only active electrode function
2. Only return electrode function
3. Both active electrode and return electrode functions

4. ❌ Neither active electrode nor return electrode functions

Question Number : 119 Question Id : 630680354339 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following processes involved in the operation of electrosurgery as per the temperature range (in increasing order) in which they take place.

P. Coagulation

Q. Desiccation

R. Carbonization

Options :

1. ✓ P, Q, R

2. ❌ Q, R, P

3. ❌ Q, P, R

4. ❌ R, P, Q

Question Number : 120 Question Id : 630680354340 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of typical electrosurgical units power settings for surgical procedures, arrange the following procedures in the increasing order of power-level range (coagulation) required by them. (Note : Range assumes the use of a standard blade electrode)

P. Thoracotomies

Q. Plastic Surgery

R. Laparotomies

Options :

1. ✓ Q, R, P

2. ❌ R, P, Q

3. ❌ R, Q, P

4. ❌ P, Q, R

Question Number : 121 Question Id : 630680354341 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of block diagram of basic pulse-echo system, arrange the following in the correct sequence.

P. Wide band amplifier

Q. Detector

R. Video amplifier

Options :

1. P, Q, R

2. Q, P, R

3. Q, R, P

4. R, P, Q

Question Number : 122 Question Id : 630680354342 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following in the context of various imaging modes found in ultrasound systems.

	Modes		Description
I	A – Mode	1	Displays the amplitude of a sampled voltage signal for a single sound wave as a function of time
II	B – Mode	2	Scanning a single line in the object and then displaying the resulting amplitudes successively
III	M – Mode	3	Brightness is used to represent the amplitude of the sampled signal

Options :

1. I-1, II-3, III-2

2. I-3, II-2, III-1

3. I-2, II-1, III-3

4. I-2, II-3, III-1

Question Number : 123 Question Id : 630680354343 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding the mechanical sector scanner with a single transducer?

- I. The sector scan rate is variable from 0 to 40 scans per second
- II. The transducer in the scanner is driven by a high performance, low inertia DC control motor
- III. The angular position of the transducer is determined photo-electrically from a sine-cosine function disc mounted on the rear of the motor shaft

Options :

1. Only I and II
2. Only II and III
3. Only I and III
4. I, II and III

Question Number : 124 Question Id : 630680354344 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

B-scanning of static objects gives _____ images which allow assessment of size, shape and position of the examined structures.

Options :

1. One-dimensional
2. Two-dimensional
3. Six-dimensional
4. Five-dimensional

Question Number : 125 Question Id : 630680354345 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For echocardiography, the transducer is placed between the _____ on the outer chest wall where there is no lung between the skin and heart.

Options :

1. First and second ribs
2. Sixth and seventh ribs
3. Third and fourth ribs
4. Fifth and sixth ribs

Question Number : 126 Question Id : 630680354346 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a part of the block diagram of an Ecocardiograph?

Options :

1. Time-base generator
2. Transmitter
3. A/D converter
4. High velocity time-base generator

Question Number : 127 Question Id : 630680354347 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding the phased array scanners?

- I. These are particularly useful for cardiac ultrasound sector scanning.
- II. A transducer measuring $1.2 \text{ cm} \times 1.3 \text{ cm}$ (2.25 MHz) and $1.2 \text{ cm} \times 0.8 \text{ cm}$ (3.5 MHz) is commonly used

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 128 Question Id : 630680354348 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of test of the grounding system in patient care areas, the impedance between the reference ground point and receptacle ground contact must be less than _____ for new construction.

Options :

1. 0.4Ω
2. 0.3Ω
3. 0.2Ω
4. 0.1Ω

Question Number : 129 Question Id : 630680354349 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

As per the force-length property of muscles ,the difference in force developed when the muscle is activated and when the muscle is passive is called the _____.

Options :

1. Active muscle force
2. Idle muscle force
3. Isometric force
4. Experimental muscle force

Question Number : 130 Question Id : 630680354350 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In which disorder of the eye a person can only see near objects and has difficulty in having a correct sharp focus of the distant objects because the eyeball is oblong or elongated so that the distance between the lens and retina is more than required?

Options :

1. Myopia
2. Hypermetropia
3. Astigmatism
4. Cataract

Question Number : 131 Question Id : 630680354351 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are the functions of Human skin?

I. Safety against sunburn

II. Synthesis of Vitamin D

III. Storage of food (fat)

Options :

1. Only I and II
2. Only II and III
3. Only I and III
4. I, II and III

Question Number : 132 Question Id : 630680354352 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are the most basic mechanical parameters of the cardiac pump, especially in the major pumping chambers, the ventricles?

I. Blood pressure

II. Volume flow rate

Options :

1. Only I

2. Only II

3. Both I and II

4. Neither I nor II

Question Number : 133 Question Id : 630680354353 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following in the context of three covering of human sense organ 'The Eye'?

	Layers		Name of the layers
I	Outermost layer	1	Sclera
II	Middle layer	2	Choroid
III	Innermost layer	3	Retina

Options :

1. I-2, II-1, III-3

2. I-2, II-3, III-1

3. I-1, II-3, III-2

4. I-1, II-2, III-3

Question Number : 134 Question Id : 630680354354 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following parts of an anesthesia machine from top to bottom.

P. Vaporizers

Q. Oxygen flush button

R. Brake

Options :

1. P, Q, R

2. ✘ Q, R, P

3. ✘ Q, P, R

4. ✘ R, Q, P

Question Number : 135 Question Id : 630680354355 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of Gas supply system of Anesthesia machine, the gas supplied by the hospital is regulated and maintained at _____ at the wall outlet.

Options :

1. ✘ 75 – 95 kPa

2. ✓ 275 – 345 kPa

3. ✘ 495 – 505 kPa

4. ✘ 110 – 135 kPa

Question Number : 136 Question Id : 630680354356 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Applanation Tonometers use the Imbert – Fick law. What is the law? (P = Pressure, S = Surface of flattened area, F = Force needed to flatten a fixed corneal area)

Options :

1. ✓ P = F/S

2. ✘ P = S/F

3. ✘ P = S × F

4. ✘ P = F + S

Question Number : 137 Question Id : 630680354357 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct regarding the indentation tonometers?

I. The intraocular pressure is based on the depth of the indentation.

II. In this instrument, the cornea is indented by a plunger loaded with different weights.

III. The values are shown on a scale ranging from 0 to 20 units.

Options :

1. ✘ Only I and II

2. ✘ Only II and III

3. ✘ Only I and III

4. ✓ I, II and III

Question Number : 138 Question Id : 630680354358 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Lithotripters produce a powerful acoustic field that results in two mechanical forces on stones and tissue. Which of the following is among those forces?

I. Direct stress associated with the high amplitude shock wave.

II. Stresses and microjets associated with the growth and violent collapse of cavitation bubbles.

Options :

1. ✘ Only I

2. ✘ Only II

3. ✓ Both I and II

4. ✘ Neither I nor II

Question Number : 139 Question Id : 630680354359 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following in the context of shock wave generator in Lithotripsy ways of generating shock wave.

	Ways of generating shock wave		Description
I	Electrohydraulic	1	Shock wave is produced via spark gap technology
II	Piezo-electric	2	Consist of multiple, spherically aligned piezo-elements inducing a very high peak pressure within a very small focal point
III	Electromagnetic	3	A high voltage is applied to an electromagnetic coil, similar to the effect in a stereo loudspeaker

Options :

1. ✓ I-1, II-2, III-3

2. ✘ I-1, II-3, III-2

3. ✘ I-2, II-1, III-3

4. ✘ I-2, II-3, III-1

Question Number : 140 Question Id : 630680354360 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The early Boyle's machine had how many elements which are still present in modern machines?

Options :

1. ✘ 13

2. ✘ 10

3. ✘ 16

4. ✓ 5

Question Number : 141 Question Id : 630680354361 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following events in the chronological order. (from first to last)

P. Stethoscope invented

Q. First Human electroencephalogram performed

R. First Cardiac pacemaker implanted

Options :

1. ✓ P, Q, R

2. ✘ Q, R, P

3. ✘ Q, P, R

4. ✘ R, Q, P

Question Number : 142 Question Id : 630680354362 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair is correct regarding the factors which determine the design of a medical measuring instrument?

I. Measurement range – Most signals are in the microvolt to millivolt range

II. Frequency range – Many signals contain dc and very low frequency components

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 143 Question Id : 630680354363 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Central Licensing Authority (CLA) of the India classifies medical devices and In Vitro Diagnostic Medical Devices (IVDMD)s into how many risk classes?

Options :

1. Four
2. Two
3. Six
4. Nine

Question Number : 144 Question Id : 630680354364 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Classification of medical devices or IVDMDs is based on which of the following principle?

- I. Combination devices or accessories to be classified separately.
- II. Calibrators used with a reagent to be have the same class as the IVDMD reagent.
- III. Software to be classified in the same class as of its associated device.

Options :

1. Only I and II
2. Only II and III
3. Only I and III
4. I, II and III

Question Number : 145 Question Id : 630680354365 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a Biodegradable or Resorbable ceramics?

Options :

1. Only calcium sulphate

2. ✘ Only hydroxyapatites
3. ✓ Both calcium sulphate and hydroxyapatites
4. ✘ Neither calcium sulphate and hydroxyapatites

Question Number : 146 Question Id : 630680354366 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Traditionally, there are _____ electrode locations in the 10/20 Electroencephalograph system.

Options :

1. ✘ 41
2. ✓ 21
3. ✘ 51
4. ✘ 36

Question Number : 147 Question Id : 630680354367 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the full form of SPECT?

Options :

1. ✓ Single Photon Emission Computed Tomography
2. ✘ Spectral Positron Emission Compact Tomography
3. ✘ Singular Passive Electron Computed Tomography
4. ✘ Single Positron Electron Compact Tomography

Question Number : 148 Question Id : 630680354368 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement correct regarding SPECT?

- I. They typically have a high sensitivity for a single slice of the source.
- II. Typically only one or at most a few non-contiguous sections could be imaged at a time.

Options :

1. ✘ Only I
2. ✘ Only II
3. ✓ Both I and II

4. ❌ Neither I nor II

Question Number : 149 Question Id : 630680354369 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the pair of electrode and their number criteria for electroencephalographs is correct?

I. Electrodes on left side of the head – odd numbered
II. Electrodes on the right side of the head – even numbered

Options :

1. ❌ Only I
2. ❌ Only II
3. ✓ Both I and II
4. ❌ Neither I nor II

Question Number : 150 Question Id : 630680354370 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a electroencephalograph, signal from the electrodes passes through various components before being recorded by the chart unit. Arrange the following components in the order in which the signal passes through them. (first to last)

P. Electrode montage selector

Q. Amplifiers

R. Writer unit

Options :

1. ✓ P, Q, R
2. ❌ Q, P, R
3. ❌ R, P, Q
4. ❌ P, R, Q