

# MEDICAL ELECTRONICS

## ASSESSMENT 1 - ANSWER KEY

---

PART - A (38 x 1 = 38 Marks)

1. The dialysis that can be performed even at home is \_\_\_\_\_

1 / 1 pt  
*Auto-graded*

Apheresis

Peritoneal Dialysis ✓

Hemodialysis

Perfusion

2. The principle behind dialysis is \_\_\_\_\_

1 / 1 pt  
*Auto-graded*

Adhesion

Cohesion

Capillary Action

Reverse – Osmosis ✓

3. The dialysate used in the dialyser consists of \_\_\_\_\_

1 / 1 pt  
*Auto-graded*

Sodium, Pottasium, Magnesium, Chlorine, Calcium ✓

Sodium, Pottasium, Magnesium, Phosphorus

Sulphur, Pottasium, Magnesium, Chlorine

Sodium, Pottasium, Manganese, Calcium, Chlorine

4. What kind of membrane arrangements does the latest dialysis machine has?

1 / 1 pt  
Auto-graded

Parallel Plate

Hollow Fibre ✓

Coil Tube

Hollow Plate

Option 2

5. The total attenuation of an ultrasound pulse passing through tissue does not depend on \_\_\_\_\_.

1 / 1 pt  
Auto-graded

Frequency

Type of tissue

The size of the pulse ✓

Distance

6. In an ultrasound image, the effect of tissue absorption at deeper regions are compensated by using:

1 / 1 pt  
Auto-graded

Dynamic focus.

Time-gain compensation ✓

Low-frequency transducers

Phased-array transducers

7. One or more ghost-images of a body structure displayed at different depths within an ultrasound image are signs of:

1 / 1 pt  
Auto-graded

Shadowing

Reverberation ✓

Refraction

Enhancement

8. In MRI the resonant frequency of a specific tissue is not determined or affected by which of these:

1 / 1 pt  
Auto-graded

- Specific isotope being imaged
- Characteristics of the molecule
- Orientation of magnetic field ✓
- Strength of the magnetic field

9. The proton resonant frequency of tissue in MRI is determined by: i. Type of tissue (fat, fluid) ii. Strength of magnetic field iii. The direction of the magnetic field iv. T1 and T2 values

1 / 1 pt  
Auto-graded

- i) and iii)
- iii)
- i) and ii) ✓
- iii) and iv)

10. Which of the following factors would be most appropriate to produce a T1-weighted image?

1 / 1 pt  
Auto-graded

- TR = 2,000, TE = 20
- TR = 2,000, TE = 100
- TR = 500, TE = 20 ✓
- TR = 500, TE = 100

11. The minimum energy required to excite the heart muscle is

1 / 1 pt  
Auto-graded

- 10  $\mu$ J ✓
- 1  $\mu$ J
- 200  $\mu$ J
- 400  $\mu$ J

12. Which device is used for starting and maintaining the normal heart beat?

1 / 1 pt  
Auto-graded

Defibrillator

Pacemaker ✓

Electrocardiograph

Echocardiograph

Option 2

13. \_\_\_\_\_ pacemaker is known as Demand Pacemaker?

1 / 1 pt  
Auto-graded

Ventricular asynchronous pacemaker

Ventricular synchronous pacemaker

Ventricular inhibited pacemaker ✓

Atrial synchronous pacemaker

14. Paddle shaped electrode is used in which device?

1 / 1 pt  
Auto-graded

Defibrillator ✓

Pacemaker

ECG

EEG

15. If the counter shock falls in the U wave segment then \_\_\_\_\_ fibrillation is produced

1 / 1 pt  
Auto-graded

Atrial ✓

Ventricular

Both

None

16. \_\_\_\_\_ DC Defibrillator normally used after the open heart surgery

1 / 1 pt  
Auto-graded

Capacitive Discharge

Double Square Pulse ✓

Biphasic

Synchronised

17. \_\_\_\_\_ ventilator consists of airtight chamber and electrically driven pump

1 / 1 pt  
Auto-graded

Positive Pressure

Negative Pressure ✓

Both

None

18. \_\_\_\_\_ tool is used for the placement of endotracheal tube

1 / 1 pt  
Auto-graded

Laryngoscope Blade ✓

Larynx Blade

Surgical Blade

Surgical Knife

19. Which is not the ventilator setting?

1 / 1 pt  
Auto-graded

Pressure

FiO<sub>2</sub>

Power ✓

PEEP

20. For what all purposes is diathermy principal used?

1 / 1 pt  
Auto-graded

- Surgical and Therapeutic ✓
- Therapeutic and Diagnostic
- Diagnostic and surgical
- Diagnostic and rehabilitative

21. What surgical functions are performed by the diathermy machine?

1 / 1 pt  
Auto-graded

- cutting, fulguration
- cutting, coagulation
- coagulation, fulguration
- cutting, coagulation, fulguration ✓

22. Which of the diathermy machine is good for deep tissue healing?

1 / 1 pt  
Auto-graded

- cold compress
- electrical impulse
- short wave ✓
- ultrasound

23. The types of therapeutic diathermy machines that exist are \_\_\_\_\_ a) Short wave, micro wave and ultrasound b) Short wave, ultrasound and cold compress c) Cold compress, microwave and electrical impulse d) Electrical impulse, microwave and ultrasound

1 / 1 pt  
Auto-graded

- Short wave, ultrasound and cold compress
- Cold compress, microwave and electrical impulse
- Electrical impulse, microwave and ultrasound
- Short wave, micro wave and ultrasound ✓

24. which is not the property of instrumentational amplifier

1 / 1 pt  
Auto-graded

Extremely high input impedence

Very low CMRR ✓

Low bias and offset currents

High slew rate

25. Which of the following amplifier is commonly used for providing protection against leakage currents?

1 / 1 pt  
Auto-graded

Isolation amplifiers ✓

Instrumentational amplifiers

Inverting amplifiers

Differential amplifiers

26. which instrument is used for recording the electrical activity of the brain.

1 / 1 pt  
Auto-graded

ECG

PCG

EEG ✓

EMG

27. which material is used to improve electrical contact in electrodes with the skin.

1 / 1 pt  
Auto-graded

Silver Tungsten

Copper Tungsten

Electrode jelly ✓

Silver Graphite

28. which is considered to be the primary pacemaker of the heart.

1 / 1 pt  
Auto-graded

bundle of his

sino-atrial node ✓

purkinje fibres

atrio-ventricular node

29. Which amplifier will reject any common mode signal that appears simultaneously at both amplifier input terminal.

1 / 1 pt  
Auto-graded

ac coupled amplifiers

dc amplifiers

carrier amplifiers

differential amplifiers ✓

30. In which electrode arrangement, the electrodes are placed opposite to each other on either side of the treated area.

1 / 1 pt  
Auto-graded

contraplanar ✓

coplanar

longitudinal

crossfire

31. To reduce back pain, the electrodes are arranged in \_\_\_\_\_ arrangement

1 / 1 pt  
Auto-graded

contraplanar

coplanar ✓

longitudinal

crossfire

32. Inductive SWT can be applied to the tissues by means of

1 / 1 pt  
Auto-graded

Drum electrode

Drum or cable electrode ✓

Air space plates

Pad electrodes

33. Applicators are used in \_\_\_\_\_ Diathermy

1 / 1 pt  
Auto-graded

shortwave

microwave

infrared

ultrasonic ✓

34. Which electrode is not used in shortwave diathermy?

1 / 1 pt  
Auto-graded

Air space electrode

Rubber pad electrode

Drum electrode

patient electrode ✓

35. In \_\_\_\_\_ diathermy, electrodes are not used for heating tissues.

1 / 1 pt  
Auto-graded

Capacitive SWD

Inductive SWD

shortwave

Microwave ✓

36. Surgical diathermy can be used to \_\_\_\_\_ tissues

1 / 1 pt  
Auto-graded

cut

coagulate

cut and coagulate ✓

warm

37. What is the other name of blending mode in surgical diathermy?

1 / 1 pt

Fulguration

Desiccation

Haemostasis

Electrotomy

38. In \_\_\_\_\_, the energy is delivered to the patient for the whole time of the treatment.

1 / 1 pt  
Auto-graded

PSWT

CSWT ✓

PSWT and CSWT

None

---

PART B (6 x 2 = 12 Marks)

39. What is Pacemaker?

2 / 2 pts

PACEMAKER : ▪Pacemaker is an electrical pulse generator used for starting and /or maintaining the normal heart beat. ▪The output of pacemaker is either delivered either externally to the chest or internally to the heart muscle.

40. What is Biphasic DC Defibrillator? 2 / 2 pts

•Biphasic Dc Defibrillator is similar to the double square pulse defibrillator such that it delivers DC pulses alternatively in opposite direction. •This type of wave form is found to be more efficient for the defibrillation of the ventricular muscles.

41. Classify the pacemaker based on its operation 2 / 2 pts

(1) Ventricular Asynchronous Pacemaker . (2)Ventricular Synchronous Pacemaker. (3) Ventricular Inhibited Pacaker.(4) Atrial Synchronous pacemaker. (5) Atrial sequential ventricular inhibited pacemaker.

42. What are the benefits of diathermy? 2 / 2 pts

Used to minimize inflammation and reduce the incidence of edema .used to treat arthritis

43. Define Fulguration 2 / 2 pts

The process of using heat from electric current to destroy abnormal tissues such as tumor. •It may also uaed to stop bleeding during surgery or after injury.It may also called as electrocoagulation.

44. What is the electrode used for i) Cutting and ii) Coagulation 2 / 2 pts

Cutting: Needle,wire loop electrodes are used. (2) coagulation: Ball,Bipolar electrodes are used.

---

---