KUMARAGURU
college of technology
character is life

Register Number:……..

B.TECH DEGREE EXAMINATIONS: NOV/DEC 2013

(Regulation 2009)

Seventh Semester

BIOTECHNOLOGY

EIE133: Biomedical Instrumentation

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. _____ transducer is used to measure the body temperature

   a) Resistive b) Capacitive

   c) Inductive d) piezoelectric

2 The velocity range of Purkinje fiber

   a) 50-60 m/s b) 2-4 m/s

   c) 10-20 m/s d) 0.5-0.6 m/s

3. The heart sounds are recorded by

   a) Electro cardiograph b) Endoscope

   c) Phonocardiograph d) Angio cardiograph

4. The average cardiac output is

   a) 5-7 l/m b) 4-6 l/m

   c) 2-4 l/m d) 3-5 l/m

5. ---------- laboratory instrument is able to operate with small amount of blood sample.

   a) spectrophotometer b) chromatography

   c) Electrophoresis d) Blood cell counter

6. The ESR normal range for new born is

   a) 2-3mm/hr b) 0-2mm/hr

   c) 3-4mm/hr d) 4-5mm/hr

7. A fluorescent intensifying screen will

a) transform X-ray energy into visible or ultraviolet light to which a photographic emulsion is sensitive
b) result in reticulation
c) decrease the graininess of the image when using gamma rays
d) increase the definition in a radiograph

8. The---------- instrument is used to remotely monitor the vital parameters of ambulatory patients

a) X-ray machine
b) CT
c) MRI
d) BioTelemetry

9. During transport of ventilated patient, the rate of oxygen consumption depends on

a) Cylinder pressure
b) Minute volume
c) The portable ventilator used
d) Bias flow.

10. Pure tone audiometer use

a) Only one frequency of vibration
b) Two different frequency of vibration
c) Two same frequency of vibration
d) Three same frequency of vibration

PART B (10 x 2 = 20 Marks)

11. Name the principle ions involved in the phenomena of producing cell potentials.
12. Define Transducer and its types.
13. Draw pregelled disposable electrode.
14. Define Cardiac output.
15. What is the pH value of arterial blood and venous blood?
16. Define GSR.
17. Distinguish Radiographic and fluoroscopic techniques.
18. Define Endoscope and mention some of its types.
19. What is stimulator?
20. What is meant by fulguration?

PART C (5 x 14 = 70 Marks)

21. a) (i) Draw the diagram and explain the equivalent circuit of a differential capacitance transducer (7)

(ii) With a neat diagram explain the operation of temperature transducer (7)

(OR)

b) (i) With neat diagram explain the working of heart and cardiovascular system. (7)

(ii) Explain resting and action potential. (7)

22. a) (i) Explain how electrodes are located using 10-20 electrode placement system (7)

(ii) Draw a neat block schematic of EMG recording system and explain its operation**.** (7)

(OR)

b) (i) Explain with relevant equations the working and measurement procedure of plethysmograph. (7)

(ii) What are the methods of measuring blood pressure? Explain about automated electro sphygmomanometer with neat sketch. (7)

23. a) (i) Where do you use clarkes electrode? Discuss the method used for measuring flow rate of O_2 in exhaust gas. (7)

(ii) Explain the working of blood cell counter with neat sketch. (7)

(OR)

b) Explain in detail the working of automated chemical analysis and spectrophotometry with neat diagram.

24. a) (i) With neat sketch explain the working of X-Ray Machine. (7)

(ii) What are the different modes of Ultra scanning with suitable diagram? (7)

(OR)

b) (i) Write a detailed technical note on the operation of MRI. (7)

(ii) Give the mathematical details of obtaining X-ray image in CT. (7)

25. a) (i) Draw the block diagram of synchronized DC defibrillator and explain its working. (7)

(ii) Explain the working of Heart lung machine with neat sketch. (7)

(OR)

b) (i) Classify various types of ventilators based on inspiratory phase, explain each (7)

(ii) Explain the haemodialysis machine with the help of schematic diagram. (7)

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