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**Question Paper Code: 54B06**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Biomedical Engineering

15UBM406-DIAGNOSTIC AND THERAPEUTIC EQUIPMENTS-I

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Arrhythmia can be diagnosed by CO1- R  
(a) EEG                      (b) EGC                      (c) Vector cardiogram                      (d) Phono cardiography
2. In the case of stable total AV block, a pacemaker is chosen CO1- R  
(a) With constant frequency  
(b) That is atrial synchronous  
(c) That is ventricular synchronous  
(d) With variable frequency and synchronization with ventricular action
3. The brain waves with frequencies between 8 and 13Hz and a mean amplitude of  $50\mu\text{V}$  are called CO2- R  
(a) Spike and waves due to Epilepsy                      (b) Delta waves  
(c) Theta waves                      (d) Alpha waves
4. An continuous signal analysis over long periods of time can be performed by frequency analysis with the aid of CO2- R  
(a) Exposing bright light                      (b) Walking along the road during sunny day  
(c) Hearing thunder                      (d) An electric shock

5. The frequency of the action potential in the relaxed muscle is CO3- U  
 (a) 20-5000 Hz            (b) 60 Hz            (c) 0 Hz            (d) 50 Hz
6. The conduction velocity in a motor nerve is normally CO3- U  
 (a) 100 m/s            (b) 50 m/s            (c) below 40 m/s            (d) 1550 m/s
7. The radiocapsules are CO4- U  
 (a) Some kind of treatment to reduce brain activity    (b) Biotelemetry transmitter  
 (c) Drugs to reduce ventricular fibrillation            (d) Used for animals to cure tumors
8. In Biotelemetry, FDM refers to CO4- R  
 (a) Frequency Division Modulation            (b) Fourier Domain Modulation  
 (c) Frequency Division Multiplexing            (d) Fesimle Distance Modulation
9. An endoscope is an instrument for examining CO5- R  
 (a) A body cavity    (b) The cancer cells    (c) Blood flow rates    (d) The head surfaces
10. The sensitivity of the thermography in the case of diagnosis of the breast cancer CO5- R  
 can be increased by  
 (a) Irradiating the tumor surface by X-rays  
 (b) Irradiating the tumor surface by Gamma rays  
 (c) Irradiating the tumor surface by ultraviolet rays  
 (d) Irradiating the tumor surface by microwaves

PART – B (5 x 2= 10Marks)

11. Bring out the salient features of phonocardiography. CO1- R
12. Distinguish bipolar technique, from the monopolar technique of measuring CO2- R  
 EEG potentials.
13. What is electromyography? CO3- R
14. Compare portable and landline telemetry unit. CO4- U
15. Write the principle of cryogenic surgery. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw the block diagram of electrocardiograph and explain the working of an ECG machine. CO1- U (16)
- Or
- (b) (i) What is meant by defibrillation? Give the difference between external and internal defibrillations. CO1- U (8)
- (ii) What is synchronized d.c. defibrillator? Draw a block diagram of it and explain its working. CO1- U (8)
17. (a) Depict the 10-20 system of placement of electrodes, and explain the acquisition and analysis of EEG signals. CO2- U (16)
- Or
- (b) (i) Summarize the different type's evoked potentials. CO2- U (8)
- (ii) Write short note on magneto encephalograph. CO2- U (8)
18. (a) Draw the block diagram for EMG recording set up and explain the method of its recording and the analysis of EMG signals. CO3- Ana (16)
- Or
- (b) (i) Briefly explain muscle simulator and nerve and simulator CO3- Ana (8)
- (ii) Write short note on: EMG biofeed back instrumentation. CO3- Ana (8)
19. (a) Discuss in detail the elements of intensive care monitoring and patient monitoring systems. CO4- U (16)
- Or
- (b) (i) Draw and explain the block diagram of a typical single channel radio telemetry system. CO4- U (10)
- (ii) Distinguish between frequency division multiplex system and time division multiplex system used in the transmission of biosignals. CO4- U (6)

20. (a) What are the uses of endoscopes in medicine? Describe any one of the therapeutic instrument using an endoscope. CO5- U (16)

Or

(b) Explain the recording through thermograph instrumentation with suitable block diagram. Also specify its different clinical applications. CO5- U (16)