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Question Paper Code:U6B01

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Sixth Semester

Biomedical Engineering

21UBM601 DIAGNOSTIC AND THERAPEUTIC EQUIPMENT

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Categorize the different types of heart sounds. CO1- U
2. Mention the specification with the ranges of the defibrillators. CO1- U
3. Sketch the brain waves obtained during the EEG measurement. CO1- U
4. Identify the instrument used to enhance self-regulation of brain activity in clinical and therapeutic settings? CO3- App
5. Differentiate central and peripheral fatigue. CO1- U
6. List out the importance of electrode placement in recording accurate EMG signals. CO1- U
7. Name the methods used to measure residual volume of the lungs. CO1- U
8. List the advantages of whole body plethysmograph over other lung volume measurement techniques. CO1- U
9. State the primary purpose of a tonometer in ophthalmology. CO1- U
10. Discuss about polygraph and its applications. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) (i) Explain in detail about electrocardiograph with necessary waveforms. CO1-U (8)
- (ii) Explain the working principle of a Holter monitor and describe its components and functions in continuous cardiac monitoring. CO1-U (8)

Or

- (b) (i) Outline the key aspects of ECG machine maintenance. Discuss the importance of regular calibration, electrode checks, and electrical safety measures. CO1-U (8)
- (ii) Explain in brief an Internal pacemaker with suitable diagrams. CO1-U (8)
12. (a) (i) Explain how EEG biofeedback instrumentation is utilized as an innovative tool for rehabilitation process. CO1-U (10)
- (ii) Describe the working of Magneto encephalo graph. CO1-U (6)
- Or
- (b) (i) Describe the multichannel EEG recording systems. CO1-U (10)
- (ii) Explain the evoked potential of visual and auditory senses. CO1-U (6)
13. (a) Discuss the factors affecting the accuracy of nerve conduction velocity measurements and propose corrective measures. CO5-Ana (16)
- Or
- (b) Scrutinize the issues related to GAIT analysis systems and suggest ways to improve accuracy. CO5-Ana (16)
14. (a) Identify the limitations of traditional spirometers. Suggest improvements to make an improved design for better lung function assessment. CO3-App (16)
- Or
- (b) Discuss the role of apnea monitors. How can they be made more reliable for newborn care? CO3-App (16)
15. (a) Analyze the importance of audiometry in diagnosing hearing impairments. How do pure tone and speech audiometry differ in clinical applications? CO4-Ana (16)
- Or
- (b) Examine the role of galvanic skin response in psychophysiological assessments. How does it aid in diagnosing stress-related conditions? CO4-Ana (16)