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Reg. No. :

Question Paper Code: U4605

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Electronics and Communication Engineering

21ECV605 -BIOMEDICAL MEASUREMENTS AND INSTRUMENTATION

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5Marks)

1. Which device is used to deliver a controlled amount of a medication over a period of time? CO1-U

   (a) Dialysis machine (b) Infusion pump (c) Autoclave (d) Oximeter

2. What does an oximeter measure? CO1-U

   (a) Body temperature (b) Blood pressure

   (c) Oxygen saturation in the blood (d) Power law

3. What does an Electromyogram (EMG) measure? CO1-U

   (a) Blood pressure (b) Body temperature

   (c) Electrical activity of muscles (d) Oxygen saturation in the blood

4. What is the full form of CT in CT scan? CO1-U

   (a) Computed Topography (b) Computerized Tomography

   (c) Computed Tomography (d) Computerized Topography

5. Which imaging technique uses a radioactive substance called a tracer to look for disease in the body? CO1-U

   (a)Ultrasound (b) X-ray (c) MRI (d) PET scan

PART – B (5 x 3= 15Marks)

6. What are the differences between voluntary muscles and involuntary muscles? CO1-U

7. What is half-cell potential? CO1-U

8. What is electrode offset voltage? CO1-U

9. Summarize the applications of telemedicine in health care. CO1-U

10. What is a bio-amplifier, and what is its primary function in biomedical applications? CO1-U

PART – C (5 x 16= 80Marks)

11. (a) Explain the basic living unit of the human body and explain its functions with suitable diagrams. CO1-U (16)

Or

(b) Illustrate the generalized components of a instrumental system and explain its functions with suitable diagram CO1-U (16)

12. (a) Identify the instrument which is used for the Inspection of block in blood flow testing artificial blood vessels during organ transplantation and Fistula creation in dialysis. CO2-App (16)

Or

(b) Identify the instrument as a pulse sensor which detects the arterial pressure pulses and converts the displacement or pressure into electrical signals. CO2-App (16)

13. (a) Identify the instrument used for measurement of electric activity of the heart and explain in detail with a block diagram. Analyze the physiological nature of ECG waveforms. CO4- Ana (16)

Or

(b) Analyze a set of EMG recordings and interpret the patterns of muscle activation displayed during different physical activities CO4- Ana (16)

14. (a) Illustrate a medical procedure that allows a doctor to observe inside of the body like digestive system,. Head and neck, including swallowing disorders and laryngitis without performing major surgery CO1-U (16)

Or

(b) Illustrate the different operations performed using endomicroscopy and explain the endoscopic laser coagulator. CO1-U (16)

15. (a) Elaborate the working of microwave diathermy machine with the help of a simplified circuit diagram. Interpret the application techniques in short- wave diathermy machines. CO5-Ana (16)

Or

(b) Define diathermy. Draw the circuit diagram of a short-wave diathermy unit and discuss its impact on therapy purpose in detail. Also briefly describe how it can be applied to human subjects? Analyze the features of Ultrasonic type diathermy. CO5-Ana (16)