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Question Paper Code : 90533

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Eighth Semester

Electronics and Instrumentation Engineering

EI 8073 — BIOMEDICAL INSTRUMENTATION

(Common to Electrical and Electronics Engineering / Instrumentation and Control Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the principle of piezoelectric transducer?
2. Define resting and action potential.
3. Define cardiac output.
4. List the indirect BP measurement Techniques.
5. Draw the typical ECG waveform and mention its significance.
6. Name of the different types of electrodes used in measurement of biopotential.
7. What is radiographic technique?
8. What is mean by endoscopy?
9. Define Diathermy.
10. What is the purpose of ventilators?

PART B — (5 × 13 = 65 marks)

11. (a) With a neat diagram explain the Respiratory systems in detail. (13)

Or

- (b) Explain in detail about the block diagram of a biomedical instrumentation system. (13)

PART C — (1 × 15 = 15 marks)

12. (a) Explain different types of spirometers for pulmonary function measurement and its operation.
- (i) Basic spirometry (5)
 - (ii) Wedge spirometry (4)
 - (iii) Ultrasonic spirometry (4)

Or

- (b) Explain in detail about measurement of
- (i) Blood pH (4)
 - (ii) pCO₂ (4)
 - (iii) Systolic and Diastolic (5)

13. (a) Discuss in detail about the ECG lead system with neat diagram. (13)

Or

- (b) Draw the block diagram of a recording setup of EEG and explain the different parts. (13)
14. (a) With a neat block diagram, explain in detail about nuclear magnetic resonance imaging (13)

Or

- (b) What is the basic principle of computer tomography? Explain it in detail. (13)
15. (a) With a neat diagram explain the working principle of hemodialysis machine. (13)

Or

- (b) Explain in detail about defibrillators
- (i) DC defibrillators (5)
 - (ii) Automatic external defibrillators (4)
 - (iii) Implantable defibrillators (4)

16. (a) Explain in detail about the instruments for checking safety parameters of biomedical equipment. (15)

Or

- (b) Explain in detail about principle, block diagram and electrodes used in surgical diathermy. (15)
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