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Question Paper Code	12224
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**

Sixth Semester

**Instrumentation and Control Engineering**

(Common to Electronics and Instrumentation Engineering)

**20ICPC602 - BIOMEDICAL INSTRUMENTATION**

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |  | <i>Marks,<br/>K-Level, CO</i> |
|--|-------------------------------|
| 1. State the importance of biomedical measurement system.                | 2,K1,CO1                      |
| 2. List out the Physiological applications of piezoelectric transducers. | 2,K1,CO1                      |
| 3. What are Korotkoff Sounds?  | 2,K1,CO2                      |
| 4. Illustrate the use of Phonocardiography.                              | 2,K2,CO2                      |
| 5. List the commonly used amplifiers in the biosignal recording system.  | 2,K1,CO3                      |
| 6. What are perfectly polarized and perfectly non polarized Electrodes?  | 2,K1,CO3                      |
| 7. Compare Hard X-rays and Soft X-rays.                                  | 2,K1,CO4                      |
| 8. List the applications of Endoscopy.                                   | 2,K1,CO4                      |
| 9. Mention some of the risks associated with surgical diathermy units.   | 2,K1,CO5                      |
| 10. State the need for Defibrillators.                                   | 2,K1,CO5                      |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Explain the Principle of operation, working and applications of Piezoelectric Transducers as a pulse sensor. 13,K2,CO1
- OR**
- b) Illustrate the Principle of operation, working and applications of Ultrasound Transducers in the biomedical field. 13,K2,CO1
12. a) Compare Dye dilution method and Indicator dilution method used for the measurement of Cardiac output. 13,K2,CO2
- OR**
- b) Explain auscultatory method used for blood pressure measurement using Sphygmomanometer. 13,K2,CO2
13. a) Explain the 10-20 electrode system used for recording electroencephalogram. 13,K2,CO3

**OR**

b) Select a proper amplifier that is widely used to chop out the noise and drift encountered during the recording of bioelectric potentials. Explain the working of all the types of the amplifier with necessary circuit diagrams. *13,K2,CO3*

14. a) Enumerate working of CT scan imaging techniques with necessary diagrams. Also explain with an example Back propagation Algorithm used for image reconstruction in CT Scan. *13,K2,CO4*

**OR**

b) Enumerate the different modes of operation of Ultrasonography. *13,K2,CO4*

15. a) Explain in detail the working of Hemodialysis Machine with necessary diagrams. *13,K2,CO5*

**OR**

b) With a block diagram of a ventilator along with its accessories and explain its functioning. *13,K2,CO5*

**PART - C (1 × 15 = 15 Marks)**

16. a) Explain in detail about electrocardiogram telemetry system and Temperature telemetry System with necessary block diagrams. *15,K2,CO4*

**OR**

b) Summarize different type of cardiac pacemakers. *15,K2,CO5*