Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May – 2017**

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| **Code :** | **14EI2017** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOMEDICAL INSTRUMENTATION** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | What is an electrocardiograph? Describe the major building blocks of an electrocardiograph machine. | CO1 | 10 |
| b. | Describe the various types of ‘Leads’ used for recording ECG signal. | CO2 | 10 |
| **(OR)** | | | | |
| 2. | a. | Descibe the working of Heart-Lung machine with a neat block diagram. Give the significance of settling chamber and Heat exchanger. | CO1 | 12 |
| b. | Membrane oxygenators provide more effective oxygenation. Justify with a neat diagram. | CO2 | 8 |
| 3. | a. | Portray and describe the various blocks of a pacemaker which works on demand and whose pulses are inhibited as long as the natural R waves are present. | CO2 | 15 |
|  | b. | Draw the shape of the pacemaker pulses. Mention the pulse to space ratio. The pulses should be negatively going pulses. Justify. | CO1 | 5 |
| **(OR)** | | | | |
| 4. | a. | Discuss in detail the design and operation of Pressure limited Ventilator system. | CO1 | 10 |
|  | b. | List out the different types of transducers for measurement of temperature in medical field. Explain the principle of thermocouples. | CO3 | 10 |
| 5. | a. | Discuss in detail the design and operation of Surgical Diathermy Machine. | CO1 | 12 |
|  | b. | Draw the type of waveforms generated for Cutting, Coagulation and Blending. Define each of the surgical procedures. | CO2 | 8 |
| **(OR)** | | | | |
| 6. | a. | Draw the block diagram of a hemodialysis machine and explain the importance of each building block. | CO2 | 12 |
|  | b. | Compare and contrast the two types of electrosurgical techniques - Mono-polar and Bi-polar with neat illustrations. | CO3 | 8 |
| 7. | a. | Explain the in-direct methods of measuring blood pressure with suitable diagrams. | CO3 | 10 |
|  | b. | Write notes on cardiac output measurement. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Illustrate with neat diagrams the working of pH electrode and PO2 electrode. | CO1 | 14 |
|  | b. | Briefly explain the working of Spectrophotometry. | CO2 | 6 |
|  | | **Compulsory:** |  |  |
| 9. | a. | How are X-rays produced? Explain the working of a X-ray tube. | CO3 | 12 |
|  | b. | Describe with the help of a block diagram the construction of a CT scanner. | CO1 | 8 |

ALL THE BEST