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 :** | **15EI2016** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MEDICAL THERAPEUTIC EQUIPMENT** | **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. | Draw the block diagram of an Automatic Implantable defibrillator and explain the main components of the same. | CO2 | 10 |
| b. | Explain the different types of electrode system and lead system used in the pacemakers. | CO2 | 6 |
| c. | List out the advantages of Biphasic waveform over Monophasic waveform in a defibrillator. | CO1 | 4 |
| (OR) | | | | |
| 2. | a. | Differentiate between the demand type pacemaker and standby pacemaker with neat block diagram for each type. | CO2 | 10 |
| b. | Suggest a suitable therapeutic device for patients who are at a higher risk of atrial fibrillation. Briefly describe it’s working. | CO1 | 8 |
| c. | Mention the minimum energy required to excite the heart muscle using a Pacemaker. Mention the pulse to space ratio. | CO1 | 2 |
| 3. | a. | Suggest a suitable device which helps in removing the unwanted metabolic waste from the blood through extracorporeal circulation. Explain the same in detail. | CO1 | 10 |
| b. | Write short notes on bubble oxygenators with a neat picture. | CO2 | 6 |
| c. | Briefly define the terms “Controlled Mandatory Ventilation” and “Mandatory Minute Volume Ventilation”. | CO2 | 4 |
| (OR) | | | | |
| 4. | a. | Design the building blocks of a life saver machine used during open-heart surgery. How does it purify the deoxygenated blood? | CO1 | 10 |
| b. | Describe the working of microprocessor controlled ventilator with the help of a neat schematic. | CO2 | 10 |
| 5. | a. | Discuss in detail the design and operation of different types of electrodes used in Shortwave Diathermy with neat diagrams. | CO1 | 10 |
| b. | Compare and contrast between shortwave diathermy and microwave diathermy. | CO2 | 5 |
| c. | What are the three basic types of shock wave sources for lithotripsy? Discuss briefly. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Suggest a suitable surgical device for removing dead cells and warts from the superficial layer of the skin. Explain its principle. Pictorise the various types of waveforms used by the same. | CO1 | 10 |
| b. | Briefly describe the production of Microwave radiation. | CO2 | 6 |
| c. | Compare and contrast the two types of electrosurgical techniques - Mono-polar and Bi-polar with neat illustrations. | CO2 | 4 |
| 7. | a. | Discuss in detail the design and operation of Microwave Diathermy Machine. Draw the different types of applicators used. | CO2 | 10 |
| b. | Suggest a suitable stimulator for treatment of chronic ventilator insufficiency. Mention the origin of phrenic nerve. | CO1 | 6 |
| c. | How do you check whether an ultrasound probe in working normally? Illustrate. | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | Describe the working mechanism of Lithotriptor System with a neat schematic of its various components. | CO2 | 10 |
| b. | Suggest and describe a suitable device that could relieve you of the chronic pain due to nerve injury. Mention the frequency of the same. | CO1 | 8 |
| c. | Define the two theories that prevents the pain message from reaching the brain. | CO2 | 2 |
|  | | **Compulsory**: |  |  |
| 9. | a. | What are the advantages of using ultrasonic for therapeutic purposes? Explain the working of an ultrasonic therapy unit with the help of a block diagram. | CO2 | 10 |
| b. | Describe the working of Helium-Neon laser. Explain its applications in medical practice. | CO3 | 10 |