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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **V** |
| **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. | 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. | CO1 | **10** |
| b. | Membrane oxygenators provide more effective oxygenation. Justify with a neat diagram. | CO1 | **6** |
| c. | Mention the use of Refractory period control circuit in a pacemaker. | CO2 | **4** |
| **(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 | **10** |
| b. | What is an implantable pacemaker? Explain the basic requirements of an implantable pacemaker. | CO2 | **8** |
| c. | Draw the shape of the pacemaker pulses. Mention the pulse to space ratio. The pulses should be negatively going pulses. Justify | CO2 | **2** |
| 3. | a. | Why do we require a synchronization function in a defibrillator? Draw the block diagram of the synchronized d.c defibrillator and explain its working. | CO2 | **12** |
|  | b. | Ilustrate with a graph the woking of “Synchronised Intermittent Mandatory Ventilation (SIMV). | CO1 | **5** |
|  | c. | Estimate the Tidal Volume (VT), of a patient whose respiratory rate is 18cycles/sec and the Minute volume is 4lit/breath. | CO2 | **3** |
| **(OR)** | | | | |
| 4. | a. | Discuss in detail the design and operation of Pressure limited Ventilator system. | CO1 | **10** |
|  | b. | Suggest a suitable defibrillator for patients who are at a higher risk of ventricular fibrillation. Briefly describe it’s working. | CO2 | **10** |
| 5. | a. | Discuss in detail the design and operation of Surgical Diathermy Machine. | CO1 | **10** |
|  | b. | Draw the type of waveforms generated for Cutting, Coagulation and Blending. Define each of the surgical procedures. | CO2 | **7** |
|  | c. | Define Hemostasis Mode of electro surgery. | CO1 | **3** |
| **(OR)** | | | | |
| 6. | a. | Enumerate the various types of electrodes used with surgical diathermy. What are the hazards associated with the use of electro surgery units? | CO2 | **8** |
|  | b. | Compare and contrast the two types of electrosurgical techniques - Mono-polar and Bi-polar with neat illustrations. | CO1 | **7** |
|  | c. | Differentiate the terms: Electrotomy, Coagulation, Fulguration, dessication and Blending with neat diagrams. | CO2 | **5** |
| 7. | a. | Describe the working mechanism of Lithotriptor System with a neat schematic of its various components. | CO1 | **10** |
|  | b. | Discuss in detail the design and operation of different types of electrodes used in Shortwave Diathermy with neat diagrams. | CO1 | **10** |
| **(OR)** | | | | |
| 8. | a. | Analyse the necessity of the three different circuits used in every Ultrasound Therapy Unit. Describe the two different techniques of administering therapeutic ultrasound. | CO1 | **10** |
|  | b. | Comment on the specifications of the electronic stimuli used in a bladder stimulator. | CO2 | **5** |
|  | c. | Suggest a suitable stimulator for treatment of chronic ventilator insufficiency. Mention the origin of phrenic nerve. | CO2 | **5** |
|  | | **Compulsory:** |  |  |
| 9. | a. | Describe the working of CO2 laser. Explain its applications in medical practice. What are the precautions which should be taken while working with the lasers? | CO3 | **12** |
|  | b. | Discuss in detail the design and operation of Microwave Diathermy Machine. Draw the different types of applicators used. | CO1 | **8** |

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