

**GANPAT UNIVERSITY**  
**B. TECH SEM- VII (BM&I) REGULAR EXAMINATION- NOV-DEC 2016**  
**2BM703: THERAPEUTIC TECHNIQUES & INSTRUMENTATION**

TIME: 3 HRS.

TOTAL MARKS: 70

**Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.  
 (2) Figures on right indicate marks.  
 (3) Be precise and to the point in answering the descriptive questions.

**SECTION: I**

- Q.1** (12)
- a) Draw the schematic diagram of DC defibrillator and explain the function of each component Used. Also give answer of 6
1. Why inductor (L) required in series of patients resistance ( $R_p$ )?
  2. What is the disadvantage of using inductor in DC defibrillator?
- b) What is functional unit of kidney? Draw the functional unit of kidney and explain the function perform by it. 6

**OR**

- Q.1** (12)
- a) For Automated External Defibrillator (AED ), give the answer of following questions 6
1. What is AED? Why it is called AED?
  2. What are the advantages of disposable electrodes used for AED?
  3. Which are the key parameters to decide the reliable shock decision in AED?
- b) Enlist performance analysis factors of Dialyzers and discuss any three performance analysis factors 6

- Q.2** (11)
- a) Briefly discuss the principle of Surgical Diathermy. Explain different mode of RF cautery machine with waveforms. 5
- b) Give a difference between baby warmer and incubator. Explain the need and function of baby warmer. 6

**OR**

- Q.2** (11)
- a) List the risk associate with the use of surgical diathermy and explain each in detail and give remedial solution of each risk. 6
- b) What is the use of defibrillator analyzers? Explain with working principle the defibrillator analyzer. 5

- Q.3** (12)
- a) Write and explain the parameter that causes undesirable fluctuation in O/P voltage of surgical diathermy machine. 3
- b) Give the advantages of biphasic waveform over monophasic waveform for defibrillation. 3
- c) Write short note on Coil type dialyzer. 3
- d) With diagram discuss the internal and external defibrillator electrode. 3



## SECTION: II

- Q.4** (12)
- What are basic requirement of the implantable pacemaker? Enumerate different types of implantable Pacemaker and draw block diagram of ventricular synchronous demand pacemaker. 6
  - What is meaning of ICHD? Write NASPE/BPEG code system used for pacemaker. 3
  - How power sources are important for implantable pacemaker? Explain all power sources for Pacemaker briefly. 3
- OR**
- Q.4** (12)
- Discuss unipolar and bipolar pacing lead system with their advantages and disadvantages. Which pacing routes are used? 5
  - Distinguish between synchronous and asynchronous pacemaker. Enlist and explain different asynchronous pacemaker modes. 4
  - How should be an ideal electrode material? 1
  - Enlist and explain various heart blocks. 2
- Q.5** (11)
- Explain different modes of ventilation given below and draw related pressure, flow and volume diagrams : 1) Assist/control mode 2) IMV 3) PEEP 4) APRV modes of ventilation 7
  - How interferential current therapy is delivered? 2
  - How microwaves are produced from magnetron? What is working principle of microwave therapy? 2
- OR**
- Q.5** (11)
- Draw pressure, volume and flow diagram with respect to time for Volume Control VC-CMV mode with Tidal volume of 750 ml, Flow rate is 50 L/min, I:E ratio is 1:2. Total breaths /min or Respiratory rate is 15 breaths / min, Peak inspiratory pressure is 20 cmH<sub>2</sub>O, and PEEP is 5 cmH<sub>2</sub>O. Keep expiratory pause time 1 sec. Draw for machine triggered ventilation. 5
  - In which case high frequency ventilators are used? 1
  - Draw neat block diagram of anesthesia machine. Describe the working of following components of machine with necessary diagrams 5
    - 1) Fail safe valves      2) Floats used in flow-meters      3) DISS system
- Q.6** (12)
- Explain the circuit of short-wave Diathermy? How automatic tuning is achieved in this machine? 5
  - Sate designing problems associated with vaporizer? Discuss the solutions associated with any one designing problem in detail. 4
  - Draw neat diagram of circle system. What is the function of APL valve? How positive pressure ventilator can be used with this system? 3

-----END OF PAPER-----