

Q.P. Code : 613300

(3 Hours)

[Total Marks : 80

N.B. : (1) Question No.1 is compulsory.

(2) Answer any **three** questions out of remaining **five** questions.

(3) **Figure** to the right indicate **full marks**

1. (a) Explain the physiological effects of low frequency currents 5
(b) Explain Circus Motion Theory 5
(c) How is Bipolar Mode different from Unipolar mode in ESU 5
(d) Explain the Principle of Condensor Method 5
2. (a) What do you understand by Cardioversion. Explain in detail with the help of a block diagram 10
(b) Explain with the help of a neat circuit diagram the INST and SYNC mode of Defibrillator Operation 10
3. (a) Explain in detail with the help of a circuit diagram, the working of Shortwave Diathermy Unit, also mention the technical specifications. 10
(b) Explain in detail the working of a Nerve Muscle Stimulator 10
4. (a) Explain with the help of a neat block diagram the working of a Hemodialysis unit 10
(b) How is temperature monitored and controlled in a Hemodialysis unit 10
5. (a) Explain with the help of a neat circuit diagram, the CUT, COAG and BICOAG selections in an ESU machine 10
(b) A capacitively coupled return electrode dielectric on an ESU has a thickness $d=0.0025\text{cm}$. The dielectric constant of the insulator ϵ_r is 3.2 and free space ϵ_0 is 8.8pF/m . Considering the Area as 120cm^2 , compute the impedance versus area for the electrode against a person's skin for an ESU operating at 500kHz 10
6. (a) Draw and explain Rate generator circuit and Rate Generator disable circuit 10
(b) Explain with the help of a neat diagram the working of an External Pacemaker 10