

Total number of printed pages-4

53 (IE 801) BMIS

2013

(May)

BIOMEDICAL INSTRUMENTATION

Paper : IE 801

Full Marks : 100

Pass Marks : 30

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

1. (a) Explain the phenomena of depolarization of cell. Briefly describe the nervous system of our body. 3+5=8
- (b) Describe about cardiovascular circulation system of human being. 8
- (c) Write about an application of piezoelectric sensor in the field of biomedical instrumentation. 4

Contd.

2. (a) Describe about different body surface electrodes with diagram. 7
- (b) Explain the electrode theory to obtain the body potential. 4
- (c) Why is preamplifier is used in biomedical equipment ?
Explain the operation of transformer and optical isolation amplifier. 1+8=9
3. (a) Briefly explain about electroretinography. 3
- (b) What do you mean by montage ? Describe how EEG signal is obtained by placing the electrodes in 10/20 system. 1+7=8
- (c) What are the functions of SA node and Purkinje fibre ?
Explain an indirect method of blood pressure measurement with necessary diagram. 2+7=9
4. (a) Define stroke volume ? Describe the dye dilution method for necessary cardiac output. 1+7=8

- (b) With the help of block diagram explain the operation of plethysmograph. 6
- (c) Describe *any two* methods to measure respiratory rate. 6
5. (a) Explain the operation of rotary anode tube X-ray machine. 6
- (b) What is doppler effect ? Explain the basic working principle of ultrasonography. 2+5=7
- (c) Explain the working principle and functional details of MRI machine. 7
6. (a) What are the ailments those lead to the use of pacemaker ? 2
- (b) What do you mean by ac defibrillation and dc defibrillation ? Describe the working principle of defibrillator machine. 2+8=10
- (c) What is the use of humidifier in ventilator machine ? What are the different mode of ventilation ? — Briefly explain *each* of them. 1+7=8

7. Write short notes on *any four* of the following :

4×5=20

- (i) Endoscopy
- (ii) Blood *pH* meter
- (iii) Biotelemetry system
- (iv) Diathermy machine
- (v) Electromyography.