Panimalar Engineering College

Internal Assessment - I

EC8073 – MEDICAL ELECTRONICS

Date : 09.08.2019 Duration : 3 Hours

Year & Dept : III ECE A, B, C, D, E Max Marks : 100

Answer **ALL** questions

PART A - (10 **x** 2 = 20 marks)

1. List out the applications of Bio-telemetry system.
2. What is the function of Haemodialysis system.
3. Bring out the need for patient plate in surgical diathermy
4. Distinguish between Internal and External Defibrillator.
5. Give the applications of diathermy.
6. What are the batteries used for implantable pacemaker?.
7. Define Desiccation and Haemostasis.
8. Distinguish between endocardiac and myocardiac electrodes.
9. What does the term fulguration refer to?
10. Compare haemodialysis and peritoneal dialysis.

Answer **ALL** questions.

PART-B (5x13=65)

11. a) How pacemakers are classified based on the modes of operation? Draw the block diagram of stand by and demand pacemakers and explain its working principle. (13)

(OR)

b) Draw a block diagram of a ventilator along with its accessories and explain its function. (13)

12. a) Explain the function of synchronized DC Defibrillator with neat block diagram. (13)

(OR)

b) Explain in detail the principle block diagram and working of haemodialyser. (13)

13. a) Briefly explain the different modes of ultrasonic scanning with suitable diagrams. (13)

(OR)

b) Draw a block diagram of MRI system and explain the image reconstruction using it. (13)

14. a) Explain the basic principle of operation of an ultrasonic diathermy unit. List out its applications. (13)

(OR)

b) Explain the working and application techniques of shortwave diathermy (13)

15. a) Explain the basic principle of operation of Microwave diathermy unit. (13)

(OR)

b) Draw the basic circuit diagram of a capacitive discharge type of cardiac defibrillator and explain the working principle (13)

Answer **ALL** questions.

PART-C (1x15=15)

16. a) A Bloodless surgery is being planned using diathermy. find which type of diathermy would be suitable to achieve this. Discuss the process involved in the surgery. (15)

(OR)

b) With suitable diagram, explain how ECG, EEG, EMG and Pulse rate signals can be transmitted using telemetry system. (15)

<<<<<<<<<<< **ALL THE BEST** >>>>>>>>>>>>

Panimalar Engineering College

Internal Assessment - II

EC8073 – MEDICAL ELECTRONICS

Date : 20.09.2019 Duration : 3 Hours

Year & Dept : III ECE A, B, C, D, E Max Marks : 100

Answer **ALL** questions

PART A - (10 **x** 2 = 20 marks)

1. Define Conduction velocity
2. List the names and frequency bands of EEG waves.
3. Draw Einthoven triangle
4. What is half cell potential?
5. State Beer Lamberts law.
6. Differentiate colorimeter and spectrophotometer.
7. What is tachycardia and bradycardia?
8. Draw equivalent circuit of surface electrode.
9. State All or nothing law.
10. Define Transmittance and Absorbance.

Answer **ALL** questions.

PART-B (5x13=65)

11. a) Draw an action potential waveform and explain the following terms, i) Resting potential, ii) Action potential, iii) Refractory Period, iv) Sodium pumping action. (2+3+3+2+3)

(OR)

b) List out the characteristics of Biopotential amplifiers and draw the circuit diagram of differential, Instrumentation and Chopper amplifier. (6+2+2+3)

12. a)Describe with suitable diagrams the various lead systems used while recording ECG signals. (13)

(OR)

b) Explain the working principle of an ECG machine with a neat diagram. (13)

13.a) Explain in detail about surface electrodes. (13)

(OR)

b) i)Draw a typical ECG waveform and mark the important features and associated function of heart. (5)

ii) Explain 10-20 electrode placement system used in EEG recording (8)

14. a) Explain the principle of pH measurement (13)

(OR)

b) Explain the principle of pO2 and pCO2 measurement (13)

15. a) Explain the working principle of colorimeter and spectrophotometer with neat diagram. (13)

(OR)

b) Explain the blood flow measurement using electromagnetic principle. (13)

Answer **ALL** questions.

PART-C (1x15=15)

16. a) How the PCG signals are generated? Explain the measurement of PCG and EMG. (5+5+5)

(OR)

b) Explain the sources of biomedical signals and compare the various bioelectric signals. (8+7)

<<<<<<<<<<< **ALL THE BEST** >>>>>>>>>>>>

Panimalar Engineering College

Internal Assessment - III

EC8073 – MEDICAL ELECTRONICS

Date : 14.10.2019 Duration : 3 Hours

Year & Dept : III ECE A, B, C, D, E Max Marks : 100

Answer **ALL** questions

PART A - (10 **x** 2 = 20 marks)

1. What is insulin pump?
2. What is impedance pneumography?
3. What is endomicroscopy?
4. List the applications of endomicroscopy.
5. What is brain computer interface?
6. Explain the principle of Telemedicine.
7. Give the difference between AV graft and AV fistula.
8. What is ventilator?
9. What is spirometer?
10. Calculate the stroke volume in millilitres if the cardiac output is 5.2 litres/minute and heart rate is 76 beats/minute.

Answer **ALL** questions.

PART-B (5x13=65)

11. a) What is radio pill? Explain the various parts of Radio pill. (13)

(OR)

b) Explain peritoneal dialysis process with neat diagram. (13)

12. a) Explain how telemedicine helps the patients and medical practitioners. (13)

(OR)

b) Explain how insulin pump works in detail with suitable diagram. (13)

13. a) Explain positive pressure ventilator with neat diagram. (13)

(OR)

b) Draw the block diagram of ultrasonic blood flow meter. Explain the method of measuring the velocity of blood flow using i) Transit time principle, ii) Doppler effect (13)

14. a) Define the term cardiac output and explain the various techniques used to determine cardiac output. (13)

(OR)

b) With a schematic diagram, describe the operation of the blood cell counter (13)

15. a) Describe any one direct and indirect method to measure blood pressure. (13)

(OR)

b) Construct and discuss the working of endomicroscopy unit in detail . (13)

Answer **ALL** questions.

PART-C (1x15=15)

16. a) Explain the working of spirometer. Explain how the respiratory measurements carried out using CO_2 method of measurement. (7+8)

(OR)

b) Discuss how the image is constructed using ultrasound with neat diagrams. (15)

<<<<<<<<<<< **ALL THE BEST** >>>>>>>>>>>>>