

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 9231

J

Unique Paper Code : 2513010013

Name of the Paper : Medical Electronics and Instrumentation (DSE)

Name of the Course : **B.Sc. (H) Electronics (NEP)**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All questions carry equal marks.
3. Attempt any **five** questions in all including Question No. 1 which is compulsory.
4. Use of non-programmable Scientific Calculator is allowed.

1. (a) Define EEG. (3)
(b) What is powerline interference? (3)
(c) Why do we require isolation amplifiers in a biomedical instrument? (3)
(d) What sensors are used in a digital blood pressure monitor? (3)
(e) What is the basic principle behind an MRI scan? (3)
(f) What do you infer from a CT scan? (3)
2. (a) What are the different artefacts encountered while recording ECG? (6)
(b) Draw the ECG waveform indicating typical time intervals and amplitude of the waves? Explain how these waves are physiologically correlated with heart's activity. (6)
(c) What is a central monitoring system? How is different from a bedside monitoring system? How is telemetry used in medical diagnostic/monitoring? (6)

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3. (a) What are X-rays? How are they useful in different fields of medical diagnostics? Briefly discuss the generation of X-rays. (6)
(b) How is an MRI scan different from a CT scan? Compare between the diagnostic results of the two scanning techniques. (6)
(c) Discuss the functioning of Ultra sonic imaging systems used for sonography. (6)
4. (a) Discuss the physiological body system involving the respiratory system. (6)
(b) Draw and discuss the functioning of a microcontroller based ECG system. (6)
(c) What types of electrodes are used in ECG, EEG and EMG systems? (6)
5. (a) Discuss the various effects of electric current on the Human body. (6)
(b) Explain the working of an Oximeter (6)
(c) Explain the functions of a Humidifier, Nebulizer and Aspirator. (6)
6. (a) Discuss the functioning of an optical glucose sensor. (6)
(b) Explain the working of a cardiac defibrillator. How is it useful in a medical condition? (6)
(c) Compare between a conventional X-ray and a digital X-ray based on its exposure and detection techniques. (6)
7. (a) Discuss cardiovascular monitoring using ECG and phonocardiography. (6)
(b) Elaborate on the testing of biomedical equipment. (6)
(c) Discuss the working of Blood cell counters. (6)