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Question Paper Code : 41273

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Sixth Semester

Electronics and Communication Engineering

080290046 — MEDICAL ELECTRONICS

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write down the specifications of a normal ECG signal for an adult.
2. Give the important characteristics of the electrodes designed to pick up signals from biological objects.
3. Enlist the various types of blood flow meters.
4. Impedance pneumography is based on what principles? The excitation frequency employed is of what range.
5. Draw the waveform used as typical discharge pulse of a dc-defibrillator.
6. Distinguish an oxygenator from a ventilator.
7. Relate the Bloch equation with NMR imaging.
8. Medical thermography uses what type of special cameras?
9. Mention the merits and demerits of transmitting EEG over telephone lines.
10. How does patient monitoring system differ from bio-medical telemetry.

PART B — (5 × 16 = 80 marks)

11. (a) Comment on the salient features of the most commonly used electrodes and micro electrodes for recording
 - (i) EEG and (8)
 - (ii) EMG signals. (8)

Or

- (b) Summarise the working of any two of the medial display systems along with suitable diagrams of their circuitry.

12. (a) Enlist the various pulmonary functions that are analysed in the pulmonary clinic. In the above, discuss the working of any one type of equipment used for measurement of respiration along with its functional block diagram.

Or

- (b) Show an arrangement for measurement of cardiac output? Justify its functioning with suitable equations and block diagrams.
13. (a) Analyse the functioning of a hemodialysis machine for purification of blood.

Or

- (b) Bring out how
- (i) pulsed ruby laser,
 - (ii) Argon laser,
 - (iii) Argon-ion laser and
 - (iv) CO₂ laser are used in the clinical side for therapy.
14. (a) With relevant sketches show how Echocardiograph (M-mode) is deployed as a valuable instrument for cardiac examinations.

Or

- (b) Discriminate the computed tomography images from conventional X-ray images. Also explain the technique of producing CT images along with its advantages.
15. (a) List out the latest trends in diagnosis and therapy in clinical field with computer applications. Specify a few commercial softwares available for the above.

Or

- (b) Write a note on the application of
- (i) VLSI design tools for electronics.
 - (ii) Lab view modules for bio-signal analysis.