

G 1262

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Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electronics and Communication Engineering

EC 010 606 L04—MEDICAL ELECTRONICS (Elective I) (EC)

(New Scheme—2010 Admission onwards)

(Regular/Supplementary/Improvement)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What is the need of micro electrodes ?
2. If a person stands up, does his heart rate increase ? Why ?
3. How does an evoked EEG response differ from a conventional electro encephalogram ?
4. List the most important components of the blood.
5. Differentiate CT scanning and CAT scanning.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. What are resting and action potentials ? Give their characteristics and explain how they are propagated ?
7. Describe sphygmomanometer method of measuring blood pressure.
8. What is meant by 10 – 20 electrode placement system ? Sketch the EEG electrode placement with its name.
9. For what measurements can a spirometer be used ? What basic lung volumes and capacities cannot be measured with a spirometer ? Why ?
10. Explain the principle and applications in medicine, of magnetic resonance imaging ?

(5 × 5 = 25 marks)

Turn over

Part C

*Answer all questions.
Each full question carries 12 marks.*

11. With neat diagrams, explain different types of biopotential transducers, with the help of examples.

Or

12. (a) Explain the functional organization of the peripheral nervous system. (8 marks)
(b) Explain the skin-electrode equivalent circuit. (4 marks)
13. With necessary diagram, explain Einthoven triangles properties and the 12 lead configuration of ECG analysis with their respective waveform.

Or

14. (a) With a circuit diagram, explain the working of an ECG amplifier? (7 marks)
(b) Explain the indicator dilution method of blood flow determination. (5 marks)
15. Design a hospital with telemetry system, explaining why you would telemeterize the functions you have selected.

Or

16. (a) What are bed-side monitors? Explain with examples. (8 marks)
(b) What is a cardiac tachometer? Explain its applications? (4 marks)
17. Explain the operation of electromagnetic and ultrasonic blood flow meters.

Or

18. With neat circuit diagrams, explain properties of the following and show how good circuits can be designed?
- (i) Isolation amplifiers.
(ii) Chopper stabilized amplifiers.
19. (a) Explain the principle of generation of X-rays. (6 marks)
(b) Describe the working principle of auto-collimators. (6 marks)

Or

20. Discuss the properties of ultrasound and how ultrasound can be used for diagnosis? Explain ultrasound imaging and its applications.

(5 × 12 = 60 marks)

