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Question Paper Code : 91371

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Sixth Semester

Electronics and Communication Engineering

EC 2021/EC 601/EC 1001/10144 ECE 11 — MEDICAL ELECTRONICS

(Regulation 2008/2010)

(Common to PTEC 2021 — Medical Electronics for B.E. (Part-Time)
Seventh Semester – ECE – Regulation 2009)

(Also common to 10144 ECE 11 – Medical Electronics for B.E. (Part – Time)
Sixth Semester – ECE — Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the frequency bands of EEG waveforms.
2. Define CMRR. Give its importance in physiological signal amplifiers.
3. What is Fick's principle? Give its disadvantages.
4. Define Cardiac output. Find the cardiac output of a person if his heart rate is 72 BPM and stroke volume is 70 ml.
5. List the typical ranges of pacemaker parameters.
6. What is Tele - Stimulation? Give its biomedical applications.
7. Give the hazardous effect of ionising radiation.
8. What is the use of Fluoroscopy?
9. State the working principle of surgical diathermy.
10. Define Micro and macro shock.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail about the origin of action potential and resting potential with necessary equations. Also draw the action potential waveform. (16)
- Or
- (b) Describe the standard 12 lead configuration used in ECG and also describe the typical ECG waveform. (16)
12. (a) (i) Describe the measurement of pCO₂. (8)
- (ii) Explain how respiration rate can be measured? Give its normal values. (8)
- Or
- (b) (i) Explain in detail the working of Coulter type Blood cell counter. (8)
- (ii) What is plethysmography? Explain how it used to measure pulse rate? (8)
13. (a) (i) Draw a circuit diagram of a fixed rate pacemaker and explains its working details. (8)
- (ii) Explain the working of Synchronised DC defibrillator. (8)
- Or
- (b) (i) Explain the construction and working of radio-pill with an example. (8)
- (ii) Explain the block diagram of single channel ECG telemetry system. (8)
14. (a) Describe in detail the construction and working of X-Ray machine. (16)
- Or
- (b) (i) Explain in detail the working principle of Cobalt and Cesium Therapy. (10)
- (ii) Discuss the uses of Radio Isotopes in diagnosis. (6)
15. (a) (i) Explain in detail the construction, working principle of thermograph. (8)
- (ii) What are the uses of endoscopes in medicine? Describe any one of the therapeutic instrument using an endoscope. (8)
- Or
- (b) (i) What are the various ways by which macroshocks can be induced? (8)
- (ii) Explain the applications of LASER in medicine. (8)