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Question Paper Code : 20450

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Fifth Semester

Electronics and Communication Engineering

EC 8073 — MEDICAL ELECTRONICS

(Common to Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How the potentials in muscle fibers are measured?
2. Sketch the typical ECG waveform. Also, recall the typical amplitude and duration of PQRS waveform.
3. State the principle involved in the electromagnetic blood flow meter.
4. Define systolic pressure and diastolic pressure.
5. Categorize the different types of electrodes used in defibrillation.
6. Compare hemodialysis with peritoneal dialysis.
7. Outline the modulation techniques used for biotelemetry.
8. Specify the frequencies used for biotelemetry.
9. Recall the necessity of telemedicine.
10. What is a Radio-pill?

PART B — (5 × 13 = 65 marks)

11. (a) With neat sketches, describe the 10-20 electrode system used in recording the EEG waveform developed in human brain.

Or

- (b) (i) Explain in detail about the recording and analysis of EMG waveforms. (6)
(ii) Describe the standard 12 lead configuration used in ECG and also describe the typical ECG wave form. (7)
12. (a) Recommend a non-invasive method of measuring cardiac output with neat sketches and explain.

Or

- (b) Identify and explain the areas of the brain, responsible for the functions of muscle movement, memory intelligence, judgment and conscious thought.
13. (a) (i) Develop a model of the heart lung machine and explain. (6)
(ii) Recommend a defibrillator suitable for termination of ventricular tachycardia and explain. (7)

Or

- (b) Discuss about the characteristic features of implantable pacemakers and also, explain the working of R-wave triggered and inhibited pacemakers.
14. (a) (i) Explain the working of short wave diathermy unit with neat sketches. (6)
(ii) Recommend a diathermy procedure suited for treatment of diseases in peripheral system and explain. (7)

Or

- (b) Describe in detail about the multiple channel telemetry system with neat diagrams.
15. (a) Explain how telemedicine plays a crucial role in today's medical care system.

Or

- (b) Summarize the role of Radio-pill in digital medicine. Outline the operation of radio pill with neat sketches.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss about the medical device used to measure the different constituents of the blood sample and their percentage of composition with neat sketches.

Or

- (b) Recommend the medication process to be carried out to the patient in the treatment of kidney failure with suitable diagram.