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**V 4252**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Eighth Semester

Mechatronics Engineering

MH 1451 — MEDICAL MECHATRONICS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define : Medical Mechatronics.
2. Why ECG is needed?
3. Give the basic principle of fiber optic transducer.
4. What is meant by Nano sensor?
5. Draw the basic Op-AMP circuit.
6. What is the use of magnetic recorder?
7. What is the effect of high and low blood pressure in human body?
8. Write short notes on Cardiac pacemaker.
9. What is meant by data reduction?
10. What are the different type of digital filtering available in signal conditioning?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain in detail the cell structure. (8)  
(ii) Explain the techniques involved in EEG. (8)

Or

- (b) (i) How are electrodes useful in the medical instrument? Explain. (8)  
(ii) How will you trouble shoot the medical equipment failures? Explain using an example. (8)
12. (a) (i) Explain the different types of photoelectric transducers. (8)  
(ii) Write short notes on transducer selection for bio-medical instrumentation. (8)

Or

- (b) (i) How are resistive, inductive and capacitive sensors are useful in biomedical instrumentation? Give one example for each. (10)  
(ii) What is bio sensor? What are the applications of biosensor? (6)
13. (a) (i) Explain the role of differential amplifier in signal conditioning. (8)  
(ii) Explain in detail about oscillographic technique. (8)

Or

- (b) (i) Explain the working principle of electron microscope. (10)  
(ii) Write short notes on Biotelemetry. (6)
14. (a) Explain the blood flow measurement by electromagnetic flow meter with neat sketch. (16)

Or

- (b) (i) Explain the techniques involved in MRI and ultrasonic scanner. (10)  
(ii) What are the negative effects in electrical shock treatment? (6)

15. (a) Explain the role of computer in biomedical diagnostic instrumentation. (16)

Or

- (b) (i) Explain the interfacing techniques for biomedical instruments. (10)
- (ii) Write short notes on ECG analysis. (6)
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