

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2125)

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B. Tech 7th Semester Examination

Bio Medical Electronics (OS)

EC-7006

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

- Note :** (i) Attempt five questions, selecting one from each of the sections A, B, C, D and all the subparts of section E.
(ii) All parts of a question should be answered at one place.
(iii) Answers should be in brief and to the point and be supplemented with neat sketches.

SECTION - A

1. (a) Draw the electrical equivalent circuit of microelectrode and explain its electrical nature. (10)
(b) With the help of neat diagram explain polarization, depolarization, action potential, resting potential, absolute and refractory period. (10)
2. (a) Briefly classify and explain respiration sensors. What are their applications? (10)
(b) Describe the possibilities of occurrence of micro shock hazards in a hospital. (10)

SECTION - B

3. (a) Distinguish a biological amplifier from a conventional amplifier with suitable equations and circuits. (10)

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- (b) Draw the block diagram of an EEG unit and explain the different parts in it. (10)
4. (a) Briefly classify and explain various types of inkjet recording system and also figure out its merits and demerits. (10)
(b) Explain with diagram the salient features of Phonocardiography (PCG). (10)

SECTION - C

5. (a) Explain the working principle and application of Non-fade display system. (10)
(b) Explain with suitable diagram the diagnostic X -Ray machine. What are the applications of X-Ray examination? (10)
6. (a) What do you mean by cardio scope? Draw and elaborate its block diagram along with applicability area in the field of biomedical electronics. (10)
(b) With the help of neat diagram explain NMR tomography in detail. (10)

SECTION - D

7. (a) Write briefly about the power sources used for implantable type of pacemaker. (10)
(b) Explain the various modulation techniques used for transmitting a biosignal in a telemetry system. (10)
8. (a) Explain the subcarrier biotelemetry system. (10)
(b) Explain the block diagram of a Patient monitoring system and discuss its design. (10)

SECTION - E

9. (a) Write down the Nernst equation.
- (b) Name the electrodes used for recording EMG and ECG.
- (c) What are the requirements for bio-amplifiers?
- (d) What is PCG?
- (e) What are the important bands of frequencies in EEG and state their importance.
- (f) Classify Pacing modes.
- (g) What is meant by fibrillation?
- (h) What is the modulation techniques used for biotelemetry and mention the reason for adopting that modulation scheme?
- (i) Distinguish between hard X-ray and soft X-ray.
- (j) What are the devices used to protect against electrical hazards? (2×10=20)