[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2123)

1401

B. Tech 5th Semester Examination

Bio Medical Engineering (O.S.)

EE-5004

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 : Candidates are required to attempt five questions in all. Selecting one question from each of the sections A, B, C & D. Section E is compulsory.

SECTION - A

1. (a) What is Biometrics? What are the various factors which should be considered while designing medical instrumentation system? Explain. **(10)**

   (b) What do you mean by "invasive" and "non invasive" instrumentation? Explain the difference between in vivo and in vitro measurements. What are the objectives of Bio medical instrumentation? **(10)**

2. (a) Explain Polarization, Depolarization, Repolarization and discuss about "Resting and Action" potential. **(10)**

   (b) Explain Electrode theory and Electrode-Tissue interfere and Metal- Electrolyte interfere phenomenon. What is Electrode Offset Voltage? **(10)**

SECTION - B

3. (a) Explain the difference between isometric and isotonic transducers. Explain the application of piezoelectric transducer in biomedical system. **(10)**

(b) Discuss the relationship among transducers used for displacement, velocity, acceleration and force measurement. **(10)**

4. (a) What are the general considerations for signal conditioners? **(10)**

(b) What are the sources of noise in low level measurements? Explain Digital Recorders and instrumentation schemes. **(10)**

SECTION - C

5. Draw an electrocardiogram (in lead II) labeling the critical features. Include typical amplitudes and time intervals for a normal person. Also describe different lead systems for ECG recording. **(20)**

6. Explain the principle of computerized axial tomography and compare its method of visualization with conventional X-ray method. **(20)**

SECTION - D

7. (a) Discuss about the nature, production and visualization of X-rays. **(10)**

(b) Write short technical notes on followings:

(i) Digital Radiography **(5)**

(ii) Dental X-Ray Machine **(5)**

8. What is the basis of Diagnostic Radiology? Discuss about physical parameters for x-ray detectors. **(20)**

SECTION - E

9. (a) What are the regulations for medical devices?

(b) How does silver-silver chloride electrode works?

(c) What is Biosensors?

(d) Write the use of jellies and creams.

(e) What is the advantage of Bio-Feedback instrumentation system?

(f) Why gantry geometry is used for?

(g) What is the difference between main amplifier and driver stage?

(h) Why pressure transducers are not sufficient for the measurement of pressure?

(i) What are the advantages of having CT scan?

(j) What are the regulatory bodies for biomedical devices?

(10×2=20)