Exam. Code: 0909
Sub. Code: 6711

1128
B.E. (Biotechnology) Fifth Semester
BIO-515: Bio-Instrumentation

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.

x-x-x

I. Answer briefly:-

a) Define gradient potential.

b) What is unipolar pacing.

c) Define the time invariance property.

d) What is labview.

e) Define larmor frequency.

f) What is significance of stimulation system in biomedical instrumentation .

g) Define attenuation coefficient.

h) Give examples of deterministic and random signal.

i) Define cardiac output.

j) What is Virtual Instrumentation?6ive examples. (10x1)

UNIT – I

II. a) What do you mean by active and passive transducers? Explain capacitive and piezoelectric transducer in detail with diagrams.

b) What do you mean by causal and non causal systems? List the different type of signals used in signal processing (any five). (5,5)

III. a) Find the fourier series for a rectangular waveform having the time period of T

X(t)=+A for -T/4 <t<+T/4

0 Elsewhere

b) What is Modulation? What are different advantages associated with this process. (5,5)

IV. a) Explain indirect blood pressure measurement by auscultatory method.

b) Explain basic principle of different blood flow measurement systems. Describe the working of anyone of these flow meters. (5,5)

P.T.O.

UNIT – II

V. a) Explain the mechanism of generation and transmission of nerve impulse. Elucidate the role of refractory period.

b) Explain the terms : Amplifier ,Lissajous patterns, ideal system, SNR, LTI system. (5,5)

VI. a) Describe various components and pacing modes of pacemaker. Explain the working of a demand pacemaker.

b) Explain the ECG and EEG waveforms. (6,4)

VII. a) Elucidate the basic mechanism, working of the device and the waveform obtained for an implantable defibrillator.

b) Explain the technique for generation and detection of ultrasound for medical imaging. Enlist the factors affecting the resolution of the image. (5,5)

x-x-x