

Exam.Code:0909
Sub. Code: 6711

1059
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. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Describe the following:-
- What do you mean by the term sampling of a signal.
 - Give two applications of computed tomography.
 - What is the unit impulse signal and its significance?
 - What is a microelectrode. Give one application.
 - Explain the importance of Fourier series and Fourier transform in bioinstrumentation.
 - Define alpha wave in EEG.
 - What do you mean by term LTI system?
 - Differentiate sensors and actuators.
 - Explain the term- korotkoff sounds.
 - Define fibrillation.
- (10x1)

UNIT – I

- II. a) What do you mean by transfer function of a system .Explain the first and second order systems.
- b) Find the Fourier transform of everlasting sinusoid : $\cos\omega_0 t$ and $\sin\omega_0 t$. (2x5)
- III. a) Find the DFT of the sequence
 $x(n)=(1 \ 2 \ 3 \ 5)$
- b) Explain the principle of working of temperature transducer and capacitive transducer. (2x5)
- IV. a) Explain the principal and technique for non-invasive blood pressure monitoring using mercury gauge.
- b) Explain the detection of cardiac output by dye dilution method. (2x5)

P.T.O.

(2)

UNIT - II

- V. Write short on the following:-
- a) Image formation in MRI
 - b) Component of pacemaker and various pacing modes (5,5)
- VI. Elucidate generation and propagation of action potential in neuron. Explain the transmission of impulse at synaptic cleft. (8+2)
- VII. a) Discuss the principle, working and application of defibrillator
- b) Explain the electrode placement and waveform obtained in ECG (2x5)

x-x-x