Registration no: | | | | | | | | | | |

Total Number of Pages: 01 **M.Tech**
ETPE203

2nd Semester Back Examination 2016-17
BIOMEDICAL INSTRUMENTATION AND SIGNAL PROCESSING
BRANCH: APPLIED ELECTRONIC & INSTRUMENTATION ENGG, COMMUNICATION ENGG, COMMUNICATION SYSTEMS, ELECTRONIC & COMM. ENGG, ELECTRONIC & INSTRUMENTATION ENGG, ELECTRONIC AND TELECOMMUNICATION ENGG, SIGNAL PROCESSING AND COMMUNICATION
Time: 3 Hours
Max Marks: 70
Q.CODE:Z1069
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions**: **(2 x 10)**

a) What do you mean by refractory period?
b) What is Sino Atrial Node?
c) Define bioelectrical signal with an example.
d) What is phonocardiogram?
e) What is the reason behind the formation of a P- wave?
f) What is a spike in EEG?
g) What is All-Or- Nothing law?
h) What are the two main properties of X- rays that is used in radiography?
i) Define invasive and non- invasive method of measurement with an example.
j) What is a catheter tip type pressure transducer?

Q2 **a)** What are the advantages of using thermisters over RTD and thermocouples in body temperature measurement? **(2)**
b) Explain the working principle of any two sensors used for body temperature measurement.? **(8)**

Q3 **a)** Explain Korotkoff method of blood pressure measurement with a neat diagram. **(5)**
b) Explain any one direct method of blood pressure measurement. **(5)**

Q4 **a)** What is the advantages of square- wave blood flowmeter over sine- wave blood flowmeter? **(5)**
b) Mention the basic principle of Laser Doppler blood flowmeter with a neat diagram. **(5)**

Q5 **a)** Draw and explain the electrode configuration of ECG ? **(5)**
b) What is the basic principle of CT- Scan? Explain with a diagram. **(5)**

Q6 **a)** Mention the different range of EEG waves and their significance in EEG analysis. **(5)**
b) What are the advantages and disadvantages of X-ray method? What are the function of a collimator and grid on X- ray? **(5)**

Q7 Explain polarization, depolarization and repolarization with a neat diagram. Draw the action potential waveform. **(10)**

Q8 **Write short answer on any TWO:** **(5 x 2)**

a) Software based medical signal detection and pattern recognition
b) Short-time Fourier transform
c) Transient Protection circuits
d) Interference Reduction techniques