Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

FIFTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: **BIOMEDICAL INSTRUMENTATION [ICE 3102]**

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	What are the body surface recording electrodes? Explain different types with neat sketches.	**5**
1B.	Explain the concept of action potential and resting potential.	**3**
1C.	Draw the schematic diagram of an EEG machine.	**2**
2A.	With the help of necessary sketches explain the lead configurations in ECG.	**5**
2B.	Draw the block diagram of atrial programmed pacemaker and explain its working.	**3**
2C.	What is a pacemaker? What are the limitations of fixed rate pacemaker?	**2**
3A.	What is a defibrillator? Explain the working of a DC defibrillator with necessary diagram. What are its advantages?	**5**
3B.	What is the function of an oxygenator? Draw the diagram and explain the membrane oxygenator.	**3**
3C.	Define the following terms: a) systole b) diastole c) cardiac output d) stroke volume	**2**
4A.	Explain the term resolution and its types with respect to ultrasound imaging. What are the different display modes used in ultrasound imaging? Explain.	**5**
4B.	What is a spirometer? With the help of a neat sketch explain the water sealed spirometer.	**3**
4C.	Draw the sketch and explain the working of the fingertip pulse oximeter.	**2**
5A.	Draw the block diagram of X-ray machine and explain its working.	**4**
5B.	What are the elements of an intensive care monitoring system? Explain.	**3**
5C.	What is the basic principle of computed tomography? With the help of a neat block diagram explain the technique for producing CT images.	**3**