Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: BIOMEDICAL EQUIPMENTS [ICE 433]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitably assumed.

1A.	Show as to how the clinically essential potentials can be evoked from the human brain in order to assess any pathology in the auditory cortex?	**5**
1B.	What is a bionic ear? Draw an audiogram indicating normal and abnormal hearing level.	**3**
1C.	Distinguish between pure tone audiometer and speech audiometer.	**2**
2A.	What is a pneumotachometer and what for it is used? Explain CO_2 method of respiration rate measurement	**5**
2B.	Explain three types of flow meters which are used to measure the flow rate of gases during breathing.	**3**
2C.	Classify the ventilators based on the type of safety limit.	**2**
3A.	What are incubators? What are the factors considered in the incubator's design?	**5**
3B.	With a neat figure, explain the two types of mechanical valves in detail.	**3**
3C.	Distinguish between mechanical and prosthetic heart valve	**2**
4A.	Write a note on different techniques involved in electro surgery. Explain the electrosurgical safety procedures	**5**
4B.	What you mean by M- scan? Explain the echocardiograph procedure with the block diagram.	**3**
4C.	Write a note on video endoscopes	**2**
5A.	Explain one type of gaseous laser in detail.	**5**
5B.	What are the precautions which should be taken while working with the lasers?	**3**
5C.	Why is injected anesthetic agent less controllable than inhaled anesthetics?	**2**
6A.	Explain the percutaneous ultrasonic lithotripsy in detail	**5**
6B.	Mention the drawbacks of the microscopic method of cell counting and explain in detail the Coulter blood cell counter.	**3**
6C.	It takes 0.2 msec for the sound to travel from the ultrasound probe to a baby's heel and back again. If the sound travels at 1500m/sec inside the body, how far is the baby's foot below the mother's skin?	**2**