Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

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

END SEMESTER DEGREE EXAMINATIONS, DECEMBER – 2018

SUBJECT: BIOMEDICAL INSTRUMENTATION [ICE 3102]

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates

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

1A	Describe the origin of bioelectric signals. Draw a typical cell potential waveform, label it properly and explain the phenomena of depolarization and repolarization.	5
1B	With the help of a diagram explain the major building blocks of an EEG machine.	3
1C	What are the limitations of conventional radiology? How it is overcome in computed tomography?	2
2A	Explain the principle of time motion display in Ultrasound imaging and discuss how it is different from other techniques with necessary diagram.	4
2B	Explain the operation of ultrasound scanner with the diagram.	3
2C	What is the principle of dialysis in the artificial kidney? What are different types of dialyzers? List two main difference between haemodialysis and peritoneal dialysis.	3
3A	Explain the working of electromagnetic blood flow meter with diagram.	4
3B	How BP can be measured directly? Explain all the three procedures.	3
3C	Explain the function of an 'Electromyograph' machine. What are the special characteristics of preamplifiers used in EMG machines?	3
4A	Explain the principle of nuclear magnetic imaging system with the help of appropriate illustrations. What is the significance of relaxation process in NMR imaging? Distinguish between T 1 and T 2 relaxation times.	5
4B	How are X-rays produced? Explain the working of a X-ray tube.	3
4C	Mention four different applications of MRI examination.	2
5A	What is Apnoea? Describe its types and the working of an Apnoea monitor with the help of a block diagram.	4
5B	Explain the working of a ventricular synchronous demand pacemaker with the help of a block diagram.	3
5C	Describe the various scanning techniques used in computed tomography. Explain how the progressive developments in scanning techniques have helped to reduce the scanning time?	3

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