

# Question Paper

Exam Date & Time: 29-Dec-2022 (02:30 PM - 05:30 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH MAKE UP EXAMINATIONS, DEC/JAN 2023

**Biomedical Instrumentation and Equipment [ICE 4064]**

**Marks: 50**

**Duration: 180 mins.**

**A**

**Answer all the questions.**

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) What are the advantages of using needle electrodes compared to body surface electrodes? (5)  
Describe the standard 10-20 electrode placement system in an electroencephalogram (EEG).  
A) [CO3, PO1, PO6, BL2]  
B) Explain the direct methods of blood pressure measurements in the heart chambers and great vessels. [CO2, PO1, BL1] (3)  
C) With a neat diagram, differentiate between bipolar limb leads and chest leads in Electrocardiography (ECG). [CO2, PO1, BL1] (2)
- 2) Which type of pacemaker can be used when there is a conduction block (atria depolarizes on its own)? Explain with a suitable block diagram. [CO4, PO1, PO6, BL3] (5)  
A)  
B) Explain the working of any one diathermy in detail. [CO4, PO1, PO2, BL1] (3)  
C) Mention the frequency range of the beta and the theta waves found in EEG signal. Also illustrate the characteristic of these waves [CO3, PO1, PO6, BL2] (2)
- 3) List the different methods used to determine arterial blood flow, and explain any one method in detail. [CO4, PO1, PO6, BL1] (5)  
A)  
B) Explain different instruments used in the endoscopy [CO1, PO1, BL1] (3)  
C) What is an electromyogram? Write any two applications of EMG. [CO3, PO1, PO6, BL3] (2)
- 4) Explain the working of MRI instrumentation system with a block diagram. [CO5, PO1, PO6, BL1] (5)  
A)  
B) Differentiate between A-scan and B-scan modes in ultrasound. Illustrate with an application. [CO5, PO1, PO6, BL3] (3)  
C) Differentiate between DC defibrillator and rectangular wave defibrillator with waveforms. [CO4, PO1, PO6, BL2] (2)
- 5) What is computed tomography? Explain the technique with the help of a diagram. [CO5, PO1, PO2, BL2] (5)

- A)
- B) Differentiate between haemodialysis and peritoneal dialysis. [CO4, PO1, PO6, BL2] (3)
- C) What are incubators in neonatal instrumentation? What are the factors considered in the incubators' design? [CO4, PO1, PO6, BL1] (2)

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