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# B.M.S. College of Engineering, Bengaluru-560019

**Autonomous Institute Affiliated to VTU**

## August 2024 Semester End Main Examinations

**Programme: B.E.** **Semester: IV**
**Branch: Medical Electronics Engineering** **Duration: 3 hrs.**
**Course Code: 23MD4PCDTE** **Max Marks: 100**
**Course: Diagnostic and Therapeutic Equipments**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

| | | MODULE - I | CO | PO | Marks |
|---|---|---|---|---|---|
| 1 | a) | Define the term Blood pressure and explain with the neat diagram of indirect type of blood pressure measurement. | CO1 | PO2 | **10** |
| | b) | Define common-mode rejection ratio (CMRR) and Construct the differential amplifier circuit of a bio signal measurement and its working. | CO2 | PO2 | **10** |
| | | **OR** | | | |
| 2 | a) | With relevant Circuit explain the principle of chopper amplifier. | CO2 | PO2 | **06** |
| | b) | Discuss how to make a measurement of respiration rate. | CO2 | PO3 | **08** |
| | c) | With a necessary block diagram explain cardiac monitoring system. | CO3 | PO3 | **06** |
| | | **MODULE - II** | | | |
| 3 | a) | Discuss in detail ear oximetry working principle. | CO3 | PO3 | **12** |
| | b) | Explicate the working principle of a complete blood gas analyzers | CO3 | PO3 | **08** |
| | | **MODULE - III** | | | |
| 4 | a) | Elucidate the Cardiac pacemakers-Need, and explain the AV synchronized working principle. | CO2 | PO2 | **12** |
| | b) | Describe the different types of defibrillators, and in detail explain the Automated type of defibrillator function. | CO2 | PO2 | **08** |
| | | **OR** | | | |
| 5 | a) | Discuss the Measurement of continuous cardiac output derived from the aortic pressure waveform with the help of dye dilution method | CO2 | PO2 | **08** |
| | b) | What is the working principle of Pulmonary Function analyzer? How is Pulmonary function measurement made ?. | CO2 | PO2 | **12** |

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| | | | **MODULE - IV** | | | |
| | 6 | a) | Illustrate the working principle of a surgical diathermy machine with a neat diagram | *CO2* | *PO6* | **10** |
| | | b) | What Ethical issues need to be considered in the design of Biomedical Instruments? | *CO2* | *PO6* | **10** |
| | | | **MODULE - V** | | | |
| | 7 | a) | Explain the concept of Artificial kidney and the Process involved in hemodialysis | *CO2* | *PO2* | **07** |
| | | b) | Explain why is Ultra filtration rate important in dialysis? | *CO2* | *PO3* | **05** |
| | | c) | What type of patients can be treated using IPPB unit and explain in detail the Operating method involved for treatment. | *CO2* | *PO3* | **08** |

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