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MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal 576104)

I SEM M.Tech. (BME) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2018

SUBJECT: BIO-INSTRUMENTATION (BME 5102)

(REVISED CREDIT SYSTEM)

Thursday, 22nd November 2018: 2 PM to 5 PM

TIME: 3 HOURS

MAX. MARKS: 50

Instructions to Candidates:

1. Answer ALL questions.
2. Draw labeled diagram wherever necessary

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| 1. | (a) | Explain working principles of different types of hemodialyzer. | 7 |
| | (b) | Describe different techniques for manufacturing Ag-AgCl electrode. | 3 |
| 2. | (a) | Explain shortwave, microwave and ultrasonic diathermy. | 7 |
| | (b) | What is population inversion in LASER? Explain. | 3 |
| 3. | (a) | Explain in detail the working principle of heart lung machine. | 7 |
| | (b) | Explain the working principle of bubble type oxygenators | 3 |
| 4. | (a) | Explain different array element configurations for ultrasound imaging. | 7 |
| | (b) | Explain X ray image detection using screen film combinations | 3 |
| 5. | (a) | Describe A scan, M scan, and B scan modes of ultrasonography in detail. | 5 |
| | (b) | Explain working principle and different types of in vitro oximetry. | 5 |