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MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, NOV/DEC 2016

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.

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| 1A. | What is cochlear implant? Explain with the help of a block diagram | 5 |
| 1B. | Explain the role of masking in audiometry and how it is achieved. What is white noise? | 3 |
| 1C. | Distinguish between pure tone audiometer and speech audiometer. | 2 |
| 2A. | What is a pneumotachometer and what for it is used? Explain the construction and working of Fleisch Pneumotachometer. | 5 |
| 2B. | Explain impedance pneumography for measurement of respiratory function. What are the limitations of this method? | 3 |
| 2C. | Differentiate between bubble and film oxygenator (2 main difference) | 2 |
| 3A. | With a schematic diagram, explain the construction and working of a pulse duplicator | 5 |
| 3B. | With a neat figure, explain the two types of caged ball valves in detail. | 3 |
| 3C. | Distinguish between mechanical and prosthetic heart valve | 2 |
| 4A. | What are the hazards associated with the use of electrosurgery units? How can high frequency circuit hazards be minimized? Explain with the help of a diagram | 5 |
| 4B. | Distinguish between 'A' and 'B' scan displays with the help of a diagram. What are the common applications of these two types of scan modes? | 3 |
| 4C. | In an electro- surgical unit, if power dissipation in 0.2 m ³ of tissue is 41.6 W, then calculate the current density. Assume tissue resistivity as 1.6 X 10 ³ Ωm. | 2 |
| 5A. | Describe the working of CO ₂ laser with the help of a block diagram. Explain the applications of CO ₂ laser in medical practice. | 5 |
| 5B. | What are the precautions which should be taken while working with the lasers? | 3 |
| 5C. | Define the following: a) rhinoscopy b) otoscope c) enteroscopy d) laparoscopy | 2 |
| 6A. | What is extra-corporeal shock wave lithotripsy (EWSL) and what type of energy used for its working? Explain the working of a lithotripter machine with the help of a block diagram. | 5 |
| 6B. | Why a humidifier is used in anaesthesia machine? Explain the function of patient breathing system in an anaesthesia machine. | 3 |
| 6C. | Compare radiant warmer and incubator | 2 |