

COLLEGE OF ENGINEERING, PUNE
(An Autonomous Institute of Government of Maharashtra)
End Semester Examination

(IE 404) Medical Instrumentation

Programme: Final B. Tech (Instrumentation and Control)

Year: 2013-14
Duration: 3 hrs

Semester: I
Max. Marks: 60

Instructions:

1. Solve **any THREE** questions.
 2. Assume suitable data if necessary.
 3. Figures to right indicate full marks.
 4. Draw neat figures wherever required.
 5. Use of non-programmable calculator is allowed.
-

- Q. 1 Answer the following:
- A) What is a microelectrode? Draw and explain in detail any one type of microelectrode? What are the challenges during manufacturing of microelectrodes? Justify with proper illustration. [8]
- B) You are required to design and realize defibrillator, suggest a suitable scheme and explain in detail with proper assumption. [6]
- C) What is a slit lamp? What for it is used? Explain in detail the construction of slit lamp. [6]
- Q. 2 Answer the following:
- A) Compare perfectly polarized and non-polarized electrodes. [3]
- B) What is EEG? How is it generated from human brain? Explain. How will you measure? Elaborate. [8]
- C) What is bionic eye? What are the challenges in designing bionic eye? How will you design bionic eye? Explain and justify. [9]
- Q.3 Answer the following:
- A) How will you measure conduction velocity of a nerve? Explain. [4]
- B) What are the challenges in designing hearing aid? How will you design and realize hearing aid? Support your answer with proper justification. [7]
- C) How do you measure various disorder associated with human heart? Explain. [7]
- D) What are the different LASERS used in ophthalmology? Compare the LASERS used in

ophthalmology.

[2]

Q. 4 Answer the following:

A) What is a heart lung machine? Draw and explain in detail the block schematic of heart lung machine.

[6]

B) What are the selection criteria for various biomaterials? List and explain in detail the typical applications of biomaterials?

[6]

C) What is a multipara-monitor? Draw and explain various blocks of multipara-monitor. What are typical specifications multipara-monitor? Explain. Comment on various alarms available in multipara-monitor.

[8]

*******All the Best*******