Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **15EI2003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOMEDICAL SENSORS AND TRANSDUCERS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Describe in detail about the generalized medical instrumentation system. | CO2 | 15 |
| b. | An LVDT has an output of 6V RMS when the displacement is 0.4 x 10-3 mm. Determine the sensitivity of this instrument in V / mm. A 10 V voltmeter with 100 scale divisions is used to read the output. Two tenths of a division can be estimated with ease. Determine the resolution of the voltmeter. | CO2 | 5 |
| (OR) | | | | |
| 2. | a. | Explain in detail about the working of strain-gage with neat sketch. | CO3 | 10 |
| b. | Sketch the parts of an ear and explain how ear function. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Write short note on photo-emissive and photoconductive cells sensors. | CO3 | 5 |
| b. | Explain in detail about the Intracranial pressure with sensors. | CO2 | 15 |
| (OR) | | | | |
| 4. | a. | Discuss the measurement of blood flow using ultrasound Doppler effect. | CO3 | 15 |
| b. | Give the details of fiber arrangement for the GaAs semiconductor temperature probe with a neat sketch | CO3 | 5 |
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| 5. |  | With a neat sketch, discuss the RTD & thermistor working principle with its applications and advantages. | CO3 | 20 |
| (OR) | | | | |
| 6. | a. | Explain in detail about mechanoreceptors types with neat sketch. | CO1 | 15 |
| b. | Draw the wheatstone bridge and derive the expressions for bridge balance conditions. | CO2 | 5 |
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| 7. | a. | Explain in detail about the thermoreceptor types and its thermal sensation pathways. | CO1 | 15 |
| b. | Write about any one of the radiation sensors. | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Describe in detail about the working of capacitive sensor with medical Applications. | CO3 | 10 |
| b. | Briefly explain the next generation robot sensor working. | CO2 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss in detail about the pH electrode with examples of arterial blood gases in different clinical situations. | CO1 | 10 |
| b. | Summarize with neat diagrams the working of PCO2 electrode and PO2 electrode measuring system. | CO1 | 10 |