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

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18BM2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOMEDICAL SENSORS AND TRANSDUCERS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course**  **Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | |
| 1. | In measurement systems, which of the following static characteristics are desirable?  a) Accuracy b) Sensitivity c) Reproduciblity d) All of the above | CO1 | 1 |
| 2. | Define Transient response. | CO1 | 1 |
| 3. | Give short notes on baroreceptors. | CO2 | 1 |
| 4. | What are the important parts of biosensor? | CO3 | 1 |
| 5. | What is a polarizable electrode? | CO4 | 1 |
| 6. | Define microelectrode. | CO4 | 1 |
| 7. | List the types of optical fiber sensor configuration. | CO5 | 1 |
| 8. | What is an enzyme electrode? | CO5 | 1 |
| 9. | Capacitive transducers normally employed for ------------------- measurements.  a) Static b) Dynamic c) both static and dynamic d) Transient | CO6 | 1 |
| 10. | What is a catheter tip transducer? | CO6 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | Write short notes on the following:  (i) Zero drift (ii) Span drift (iii) Zonal drift | CO1 | 3 |
| 12. | What is the working principle of smell sensors? | CO2 | 3 |
| 13. | What are biosensors? Explain with suitable example. | CO3 | 3 |
| 14. | What are the different types of bio potential electrode? | CO4 | 3 |
| 15. | Write the working principle of electrolytic tilt sensor. | CO5 | 3 |
| 16. | What are the indirect methods of blood pressure measurement? | CO6 | 3 |

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| **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | |
| 17. |  | Draw and explain generalized block diagram of medical instrumentation system. | CO1 | 12 |
| 18. |  | Explain dynamic performance characteristics of transducer in detail. | CO1 | 12 |
| 19. |  | Explain about various mechanoreceptors. | CO2 | 12 |
| 20. |  | Discuss in detail about types of membranes used in biosensor. | CO3 | 12 |
| 21. |  | Explain about Ag-AgCl and PCO2 electrodes. | CO4 | 12 |
| 22. |  | Discuss in detail about photomultiplier tude and photovoltaic cell. | CO5 | 12 |
| 23. |  | Explain piezoelectric phenomenon and describe a piezoelectric pressure transducer with neat diagram. | CO6 | 12 |
|  |  | **Compulsory:** |  |  |
| 24. |  | Explain construction and working principle of LVDT with its merits and demerits. | CO6 | 12 |