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



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

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| **Code :** | **18BM3001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED MEDICAL INSTRUMENTATION DESIGN** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. | a. | Give an account on the different parts of central nervous system and their activity. | CO1 | 8 |
| b. | Summarize the physiology of cardio vascular system. | CO1 | 8 |
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| 2. | a. | Discuss the concept of action potential and bioelectric potentials. | CO2 | 8 |
| b. | Elaborate on the measurement technique involved in the electrical activity of heart. | CO2 | 8 |
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| 3. | a. | Design an instrumentation system to measure temperature. | CO3 | 8 |
| b. | A 20 mm length of wire used as a strain gauge exhibits a resistance of 150Ω. When a force is applied in tension, the resistance changes by 2Ω and the length changes by 0.07 mm. Find the gauge factor. | CO4 | 4 |
| c. | A transducer has a sensitivity of 10 μV/V/g. Predict the output voltage for an applied force of 15g if the excitation potential is 5Vdc. | CO4 | 4 |
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| 4. | a. | Highlight the calibration methods for blood pressure measurement system. | CO4 | 8 |
| b. | Select a suitable sensor for the measurement of heart sounds. | CO4 | 8 |
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| 5. |  | Design a suitable instrumentation system for respiration measurement. | CO3 | 16 |
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| 6. | a. | Suggest suitable methods to provide artificial mechanical ventilation. | CO6 | 8 |
| b. | Investigate the typical faults and maintenance procedures for ventilators. | CO5 | 8 |
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| 7. |  | Analyze the various types of flow measurement transducers. | CO4 | 16 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Design a suitable EEG amplifier. | CO2 | 10 |
| b. | Analyze how visual and auditory evoked potentials can be recorded using EEG. | CO5 | 10 |