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



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

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| **Code :** | **17BM2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOMECHANICS PROSTHESIS AND ORTHOSIS** | **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. | Analyse the characteristics of stress and strain on human bones. | CO4 | 10 |
| b. | Calculate the stress in a medical implant material subjected to tensile load of 20KN. The dimensions of the material are 300 mm length and 20 mm circular diameter. Calculate the extension of the material if the Young’s modulus is 200 x 109 N/m2. | CO6 | 10 |
| **(OR)** | | | | |
| 2. | a. | Design the stress measurement system using strain gauge sensor. | CO6 | 15 |
| b. | Present the modeling of mechanics of human muscle. | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | Confer the applications of human factors in medical field. | CO3 | 12 |
| b. | Discuss the cause of human error in recording patient data. | CO2 | 8 |
| **(OR)** | | | | |
| 4. | a. | Discuss the various types of occupational hazards for clinician. | CO5 | 10 |
| b. | Infer the safety measures to be followed for medical personnel. | CO3 | 10 |
|  |  |  |  |  |
| 5. | a. | Analyse the process of Gait activities in human. | CO4 | 10 |
| b. | Evaluate the methods of Gait measurement system. | CO5 | 10 |
| **(OR)** | | | | |
| 6. | a. | Explain the applications of Hand prosthetic device in detail. | CO3 | 10 |
| b. | Present the merits and demerits of prosthetic devices. | CO2 | 10 |
|  |  |  |  |  |
| 7. | a. | Present the modeling and analysis of orthotic devices. | CO4 | 6 |
| b. | Explain the applications of implants that benefit human life. | CO3 | 14 |
| **(OR)** | | | | |
| 8. | a. | Analyse the mechanism of fracture in human bones. | CO4 | 10 |
| b. | Evaluate various materials and its characteristics for bone implants. | CO5 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the working principle of a medical robot. | CO4 | 10 |
| b. | Enumerate the applications and discuss the merits of robotic surgery. | CO3 | 10 |