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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **15EI2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FUNDAMENTALS OF BIOMECHANICS** | **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. | Illustrate the working principle of digital manometer with a sketch and mention its advantages. | CO1 | 10 |
| b. | State the normal and abnormal range of blood pressure in humans. | CO1 | 4 |
| c. | State the Bernouli’s law of fluid flow. | CO1 | 4 |
| d. | Present the condition for a fluid to flow in human circulatory system. | CO1 | 2 |
| (OR) | | | | |
| 2. | a. | Express the nature of stress strain curve. | CO1 | 6 |
| b. | Differentiate point load and distributed loads. | CO1 | 4 |
| c. | Develop the strain gauge and circuit for strain measurement using operational amplifier. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Mention the rheological properties of human blood. | CO2 | 6 |
|  | b. | Classify the types of fluids based on its Reynould’s number. | CO2 | 4 |
|  | c. | Demonstrate the non invasive method of measurement of cardiac output. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Give the structure and characteristics of osteophorosis. | CO3 | 6 |
|  | b. | Explain few methods that strengthen the bones. | CO4 | 4 |
|  | c. | Construct a methodology of indicating body mass index. | CO3 | 10 |
|  |  |  |  |  |
| 5. | a. | Elucidate the physiology of blood circulation system. | CO5 | 10 |
|  | b. | Show the mechanism of fracture in bones. | CO5 | 10 |
| (OR) | | | | |
| 6. | a. | Write the functions of prosthesis. How does it benefit humans. | CO5 | 6 |
|  | b. | List the merits artificial heart valves. | CO5 | 4 |
|  | c. | Sketch and explain the working principle of various types of human heart valves and artificial heart valves. | CO5 | 10 |
|  |  |  |  |  |
| 7. | a. | Illustrate various muscle activities. Explain the technology for signal recording from muscle. | CO5 | 10 |
|  | b. | Discuss the methods of improving muscle strength. | CO5 | 4 |
|  | c. | Explain the construction and working of electroencephalogram. | CO5 | 6 |
| (OR) | | | | |
| 8. | a. | List few merits of assist devices for humans. | CO6 | 6 |
|  | b. | List the advantages of exoskeleton for disabled subjects. | CO6 | 10 |
|  | c. | What is a force plate? Detail the application of force plate. | CO6 | 4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Draw and explain the functional aspects of wheel chair. | CO6 | 6 |
|  | b. | Analyse the merits conventional and motorized wheel chair. | CO6 | 8 |
|  | c. | Present the benefits of the scooter type assist device for the disabled. | CO6 | 6 |

ALL THE BEST