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 – April / May – 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. |  | Apply the principle of stress and strain in designing physiotherapy equipment. Also evaluate the significance of stress strain curve in biomechanics. | CO3 | 20 |
| (OR) | | | | |
| 2. | a. | State Newton’s laws of motion. | CO1 | 5 |
| b. | What can happen to a unit volume inside a body on the application of external loads/forces/constraints? | CO2 | 5 |
| c. | Comment on the significance of qualitative and quantitative analysis. | CO2 | 5 |
| d. | Explain the effect of viscosity in blood flow. | CO1 | 5 |
| 3. |  | A person experience a pain in his legs, after consultation recognized that there was issues in the cortical. Analyze the case an reasons for the same. | CO3 | 20 |
| (OR) | | | | |
| 4. | a. | Differentiate normal stress and shear stress in bone fracture. | CO2 | 5 |
|  | b. | Comment on elastoplastic behavior of bones. | CO1 | 5 |
|  | c. | Evaluate bone properties with respect to the loading. | CO3 | 5 |
|  | d. | What are the major factors that affect mechanical behavior of the bones? | CO2 | 5 |
| 5. |  | Apply the principle of stress and strain in designing cardiovascular. equipment when blood vessel is treated as a 3D body. | CO3 | 20 |
| (OR) | | | | |
| 6. | a. | Explain in brief the process of thrombogenesis. | CO2 | 8 |
|  | b. | Analyze the effect of Fluid-Mechanical Interaction of Red Blood Cells with a Solid Wall. | CO3 | 12 |
| 7. |  | In a pedobarograph the foot pressure measured was abnormal. How can you relate this with a GIAT and its phases? | CO3 | 20 |
| (OR) | | | | |
| 8. |  | With relevant case studies explain in detail the GIAT flow chart and its significance. | CO2 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain knee prosthesis and its related biomechanical principles. | CO3 | 10 |
|  | b. | Comment on hip structure, loads on hip and its prosthesis. | CO2 | 10 |