

**Question Paper Code: 99B17**

B.E./B.Tech. DEGREE EXAMINATION, DEC 2021

Elective

Biomedical Engineering

19UBM 917 - Rehabilitation Engineering and Robotics

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

- |  |         |
|--|---------|
| 1. State the design considerations related to rehabilitation.  | CO2 App |
| 2. As a rehabilitation engineer, what would be the major activities to overcome day to day needs of disabled people? | CO3 Ana |
| 3. Name few orthotic devices and their uses.   | CO1 U   |
| 4. Compare a prosthesis and Orthosis.  | CO3 Ana |
| 5. Mention the advantages and disadvantages of manual wheelchairs.   | CO1 U   |
| 6. Define the principles of coordination exercises.  | CO1 U   |
| 7. Define Robot.   | CO1 U   |
| 8. Mention the benefits of industrial robots?  | CO1 U   |
| 9. How is robot different from human?  | CO2 Ana |
| 10. Define robot technology.   | CO1 U   |

PART – C (5 x 16= 80Marks)

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|---|---------|------|
| 11. (a) Outline the concepts and principles of rehabilitation engineering.                      | CO2-App | (16) |
| Or  |         |      |
| (b) Elaborate on the loss of hearing and point out the ways to augment and substitute the same. | CO2-App | (16) |
|   |         |      |
| 12. (a) Elaborate in detail the Knee ankle foot orthoses (KAFO).                                | CO1-U   | (16) |
| Or  |         |      |

- (b) Discuss about the various types of orthotic devices available for the lower limb. CO1-U (16)
13. (a) Elaborate on the types of wheelchair designs quoting their variations in structural and functional aspects and control systems. CO1-U (16)
- Or
- (b) Discuss about the fundamental of a manual wheel chair's propulsion stating the biomechanics involved behind its operation. CO1-U (16)
14. (a) Outline the concepts and principles of robotics. CO1-U (16)
- Or
- (b) Explain the overview of robot subsystems. CO1-U (16)
15. (a) How quickly are robots developing in this day? CO3-Ana (16)
- Or
- (b) Summarize the rehabilitation robotics in recent areas. CO3-Ana (16)

