Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

BIOMEDICAL ENGINEERING
VII Semester
BM5015 & Rehabilitation Engineering
(Regulations 2019)

Time: 3hrs | Max.Marks: 100

CO1	Understand the key terminologies used by the rehabilitation team.
CO2	Devise new concepts for future development and applications.
CO3	Design and develop different sensory assist devices, orthotics and prosthetics for rehabilitation applications.
CO4	Understand the need of virtual reality tools for different aids.
CO5	Appreciate the legal aspects for building rehabilitation aids for the needed people.

BL – Bloom's Taxonomy Levels
(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Differentiate disability and impairment with an example.	2	1	L2
2	An aged person can no longer withstand his/her body weight due to muscle weakness. Suggest an appropriate technology for the person to walk and mention the reason for suggesting the same.	2	1	L2
3	Draw the block diagram of the rehabilitation aid that replaces the function of inner ear.	2	3	L3
4	Define the design considerations to be met for a tactile display.	2	3	L3
5	What is HAS? Give an example.	2	3	L1
6	Define various components of a prosthesis.	2	3	L1
7	What is Virtual Reality? List two of its applications in rehabilitation.	2	4	L2
8	What is PHANToM?	2	2	L1
9	List the psychological aspects of rehabilitation therapy.	2	5	L2
10	What is SAID principle?	2	5	L2

PART- B (5 x 13 = 65 Marks)

Q. No	Questions	Marks	CO	BL
11 (a) (i)	Define and describe the importance of community-based rehabilitation.	7	1	L2
(ii)	Brief about education and social aspects of CBR.	6	1	L2
	OR			
11 (b) (i)	Define ADL and how are ADL of PwDs graded? Brief with an example.	7	1	L2
(ii)	Describe the classification of rehabilitation team members and mention their role in the rehabilitation process.	6	1	L2
12 (a) (i)	Explain the Brainport Vision technology with neat illustration.	7	2	L3
(ii)	Brief any one sensory substitution system for an auditory impaired person.	6	2	L3
	OR			

12 (b) (i)	Describe the working of OPTACON.	**7**	2	L3
(ii)	Write short notes on any one type of computerized wheelchair designated for a paralytic patient.	**6**	2	L3
13 (a) (i)	Design an FES-based rehabilitation system for drop foot condition and explain its working with a neat illustration.	**13**	3	L3
	OR			
13 (b) (i)	Discuss the design and control mechanism of a myoelectric-based prosthesis for transradial amputation.	**13**	3	L3
14 (a) (i)	Describe the working of VR-based system.	**7**	4	L2
(ii)	With an example, explain how VR aids in motor control and coordination.	**6**	4	L2
	OR			
14 (b) (i)	Brief Haptic technology with a block diagram.	**7**	4	L2
(ii)	Describe the working of a haptic device for hand motor recovery.	**6**	4	L2
15 (a) (i)	Describe the provisions established by the Indian government for PwD in education, employment, and transport domains.	**13**	5	L3
	OR			
15 (b) (i)	What are short- and long-term goals in rehabilitation? Explain in detail the physiological aspects of function recovery in connection with the goals.	**13**	5	L3

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16. (i)	Explain the design and features of an orthosis for the treatment of median nerve injury along with its implications.	**10**	3	L4
(ii)	Brief any two methods to assess the outcome of rehabilitation in the above case to restore active arm movement.	**5**	1	L4