

**Code No: M1122 /R07**

**Set No. 1**

**IV B.Tech. I Semester Supplementary Examinations, February/March - 2011**

**REHABILITATION ENGINEERING**

**(Bio-Medical Engineering)**

**Time: 3 Hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

- 1) Explain how the restoration of standing and walking is done using orthopedic prosthesis.  
b) Describe the method of active prosthesis with an example. [8+8]
2. a) Explain the role of Ergonomics in Rehabilitation process.  
b) Describe the Ergonomic aspects present in controlling devices in a working environment. [8+8]
3. a) Describe the principle behind working of MARCUS intelligent hand prosthesis.  
b) Write a note on Visual Augmentation and substitution techniques [8+8]
4. a) Explain the concept of cochlear implantation.  
b) Write a note on robotics usage in rehabilitation. [8+8]
5. a) Explain briefly about measurement tools used in rehabilitation engineering.  
b) Explain how the assist device characterization is used in the measurement. [8+8]
6. a) Explain the term decision making processes in rehabilitation with an example.  
b) Explain different methods used in Lip Reading [8+8]
7. a) Explain the usage of computers in visual perception compensation.  
b) Explain the brain-computer interface with an application [8+8]
8. Write short notes on: [4+4+4+4]
  - a) Orthopedic Prosthetics
  - b) Auditory augmentation.
  - c) HAS
  - d) Sensory rehabilitation.

**Code No: M1122 /R07**

**Set No. 2**

**IV B.Tech. I Semester Supplementary Examinations, February/March - 2011**

**REHABILITATION ENGINEERING**

**(Bio-Medical Engineering)**

**Time: 3 Hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

1. a) Explain how the sensory and motor concepts are used in rehabilitation engineering.  
b) Explain the principle involved in the intelligent prosthetic knee. [8+8]
2. Describe the ergonomic aspects present in Devices and controls in an Operation Theater. [16]
3. a) Explain the engineering concepts involved in communication disorders.  
b) Explain in detail about Electronic speech synthesizers [8+8]
4. a) Design a wheel chair. Mention its use.  
b) Explain the role of computer in rehabilitation process. [8+8]
5. a) Characterize the human systems and subsystems with the help of schematic.  
b) Write briefly about different environmental control systems. [8+8]
6. a) Describe the use of robot as a manipulation aid in the rehabilitation process.  
b) Explain the subjective measurement methods used in rehabilitation engineering. [8+8]
7. a) Explain the use of computer in lip reading.  
b) Describe the use of Bimodel lip tracking algorithm in rehabilitation. [6+10]
8. Write short notes on:
  - a) Measurement Tools
  - b) Orthotic Knee Joint
  - c) BCI
  - d) Environmental Control Systems [4+4+4+4]

**Code No: M1122 /R07**

**Set No. 3**

**IV B.Tech. I Semester Supplementary Examinations, February/March - 2011**

**REHABILITATION ENGINEERING**

**(Bio-Medical Engineering)**

**Time: 3 Hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

- 1) Explain the application of various engineering concepts in sensory rehabilitation.  
b) Explain the requirements and considerations in design of prosthetic hand with control. [8+8]
2. a) Explain the different Ergonomic models in a process control room.  
b) Explain the Engineering concepts used in information device design. [8+8]
3. a) Distinguish between visual augmentation and visual substitution.  
b) Distinguish between tactual augmentation and tactual substitution [8+8]
4. a) Explain the physiology of human auditory system. What is auditory tactual substitution and auditory vision substitution?  
b) Explain the use of computer in the design of prostheses. [10+6]
5. a) Explain about different techniques to accelerate the communication.  
b) Distinguish between Pneumatic and Electronic Larynx. [8+8]
6. a) Explain about different measurements needed for decision making.  
b) Explain in detail about the active above knee prosthesis. [8+8]
7. a) Explain about different technical concepts to improve the mobility of a human being.  
b) Explain about characterizing the overall system in typical situations. [8+8]
8. Write short notes on:  
a) Cochlear implantation  
b) Environmental Control Systems.  
c) Computer assisted lip reading. [5+5+6]

**Code No: M1122 /R07**

**Set No. 4**

**IV B.Tech. I Semester Supplementary Examinations, February/March - 2011**

**REHABILITATION ENGINEERING**

**(Bio-Medical Engineering)**

**Time: 3 Hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

- 1) Explain the role of Rehabilitation Engineering in designing communication aids.  
b) What are the considerations in designing an intelligent prosthetic knee? [8+8]
2. a) Explain the design of a Ergonomic wheel chair, with a diagram. Mention its use.  
b) Explain the role of Ergonomics in Rehabilitation process. [8+8]
3. a) Explain how the customized design of the components are useful for rehabilitation.  
b) Describe the making of a Myoelectric hand in detail [8+8]
4. a) Explain in detail about FES systems..  
b) Distinguish between Pneumatic and Electronic Larynx. [8+8]
5. Explain about different considerations in designing the technical aids for augmentation communication. [16]
6. How do you obtain the descriptive and quantitative information for decision making about a human task? Explain in detail. [16]
7. a) Explain the use of computer in lip reading.  
b) Describe the use of Bimodel lip tracking algorithm in rehabilitation. [6+10]
8. Write short notes on: [5+5+6]
  - a) Methods of objective measurement
  - b) Visual perception.
  - c) Accelerating Techniques.