

GANPAT UNIVERSITY
B. TECH (BM&I) SEM- VIII CBCS REGULAR EXAMINATION- APRIL-JUNE 2017
2BM802 : Prosthetics & Orthotics

TIME: 3 HRS

TOTAL MARKS: 70

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
 (2) Figures on right indicate marks.
 (3) Be precise and to the point in answering the descriptive questions.

SECTION: I

- Que. 01** **Answer the following questions.** [12]
- a) How do we hear? What are the causes of hearing loss? Explain the types of hearing loss and hearing aid in detail. [6]
 - b) What is the significant of artificial heart? Explain the material requirements, design consideration and manufacturing process of an artificial heart. [6]

OR

- Que. 01** Explain the working of following types of Cardiac Prosthesis Devices with the help of suitable diagram. [12]
1. Mechanical Heart Valves
 2. Jarvik-7 Total Artificial Heart
 3. AbioCor Artificial Heart

- Que. 02** **Answer the following questions.** [11]
- a) What is Laryngectomy? What are the ways to make people sound again, after having a laryngectomy? Explain each method in brief. [6]
 - b) Which types of materials have been used for the construction of Wheel chair? Give the comparison between Manual Wheelchair and Power Wheelchair. [5]

OR

- Que. 02** **Answer the following questions.** [11]
- a) Enlist and explain the advantages and disadvantages of following types of prosthetic devices: [6]
 1. Cochlear implant
 2. Bionic Eye
 3. Left Ventricular Assist Device (LVAD)
 - b) Write short note on Bionic Arm. [3]
 - c) Describe the retinal disease briefly. [2]

- Que. 03** **Answer the following questions.** [12]
- a) Draw and explain the schematic of heart-lung machine describing the pumping mechanism. What factors should be considered while designing the heart-lung machine. [6]
 - b) What is the difference between hearing aid and Cochlear implant? Explain the working of Cochlear implant giving neat diagram. Also enlist the risks associated with Cochlear implant. [6]

SECTION: II

Que. 04 **Answer the following questions.** **[12]**

- a) What is polio? Classify various types of calipers and give reasons in detail why plastic calipers are widely used. [6]
- b) Write a short note on Design, construction and application of SACH foot. [6]

OR

Que. 04 **Answer the following questions.** **[12]**

- a) Compare in detail Dynamic Response foot with Conventional prosthesis foot. [6]
- b) Define following terms:
(1) Prosthesis (2) Orthosis (3) Leverage system (4) Reinnervation [4]
- c) Why the most common shape of suspension in prosthesis is harness of 8? [2]

Que. 05 **Answer the following questions.** **[11]**

- a) Explain the role of liners & suspension in the design of prosthesis. Also state the common factors which judge the success of prosthesis design. [6]
- b) Explain stage wise the development of Knee OA in human body. Which biomechanical factors are analyzed before deciding the suitable braces? [5]

OR

Que. 05 **Answer the following questions.** **[11]**

- a) Which different biomechanical factors are considered while designing the articulating joint of lower limb prosthesis? Explain each of them briefly. [6]
- b) Classify the upper limb prosthesis on the basis of its powering system and explain myoelectric prosthesis in detail. [5]

Que. 06 **Answer the following questions.** **[12]**

- a) Define the term Neuroprosthesis. Discuss the technological advancement in field of Neuroprosthesis giving suitable examples. [6]
- b) Justify the statement that "The most common system used in knee brace is 3 – point leverage system to solve the varus & valgus knee in Knee OA." [6]

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