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(REVISION: 2015)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

BIOMATERIALS AND PROSTHETIC DEVICES

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Give two uses of cobalt chromium alloys.
2. What is NITINOL ? Give one application.
3. What are thermoplastic ?
4. Define stance phase.
5. What is scoliosis ?

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Illustrate tissue responses to biomaterials.
2. Explain composite materials.
3. Explain the properties of biodegradable polymers.
4. Differentiate between homograft and heterograft with examples.
5. Explain different correction procedures for scoliosis.
6. Explain properties and applications of ceramic implants.
7. How is glaucoma and tonometer related ? What are the different types of tonometer ?

(5 × 6 = 30)

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## PART — C

(Maximum marks : 60)

(Answer one full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) What is biocompatibility ? What are the requirements of biomaterials ? 8  
 (b) How are the biomaterials broadly classified ? Briefly describe the properties of each type and give examples. 7
- OR
- IV (a) Explain the host response to biomaterials. 7  
 (b) Explain the composition and properties of stainless steel alloys. Mention its application. 8

## UNIT — II

- V (a) What is polymerization ? Distinguish between condensation polymerization and Addition polymerization. 8  
 (b) Describe the properties and applications of natural rubber and synthetic rubber. 7

OR

- VI (a) Explain acrylic polymers with examples. 7  
 (b) Describe in detail vascular implants. 8

## UNIT — III

- VII (a) Draw and label a total knee replacement. 6  
 (b) Explain different types of heart valves used in medical field. 9

OR

- VIII (a) Explain the Dwyer's technique used for the correction of scoliosis with diagram. 7  
 (b) Explain with a neat diagram of a total knee replacement. 8

## UNIT — IV

- IX (a) Explain Mackay Marg indentation tonometer. 7  
 (b) Explain in detail gait analysis. 8

OR

- X (a) Describe a pedobarograph. 7  
 (b) Explain Goldman's applanation tonometer with a neat diagram. 8