

FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI  
SCHOOL OF HEALTH TECHNOLOGY,  
DEPARTMENT OF PROSTHETICS AND ORTHOTICS TECHNOLOGY  
SESSION: 2018/2019. RAIN SEMESTER EXAMINATION, OCTOBER 2019

POT 504. Prosthetics & Orthotic Component and Production Time: 2hr.

**Section A. Answer all questions (2 marks each).**

1. The screw of an injection molding machine is referred to as.....
2. Outline 8 classifications of composites
3. Fibres packaged in tows include .....and .....
4. Precursors for carbon fibers include ..... and .....
5. Outline the types of carbon fibres
6. Outline the properties of Aramid fibres
7. A composite fabrication technique employed in the fabrication of a thoracolumbar orthosis/ articulated foot orthosis is.....
8. What is the purpose of sizing in fibre-reinforced composite materials
9. Outline the methods of assembling component of a prosthetic/ orthotic device
10. Describe the types of glass fibres used in composite technology

**Section B. (Question 1 is compulsory (30 marks) and any other 2 (15 marks each) )**

A. For a fibre reinforced composite

List the functions of the matrix and fibre phases

How does the quality of the fibre-matrix interface influence the strength, stiffness and toughness of the composite.

A client approaches you to design a prosthetic foot using a composite lamina, he intends the foot to carry shear loads and transverse loads. With the aid of an illustrative diagram design the composite lamina for the specification

B. i. List 10 ancillary instruments/equipments and state their roles/uses in orthopaedics

ii. What are the draw backs to the use of implants

iii. A 33year old woman had a mid-shaft fracture of the tibia, state your choice of implant that can be used to fix the fracture and why?

2a. Describe the following and state where each of them can be used: i, Orthopaedic plates ii, Orthopaedic screws iii, Intramedullary nails iv, Orthopaedic wires v, pins.

b. Use a diagram to show different models of Orthopaedic plates

c. Explain osseointegration and state the role of implant/prosthesis in osseointegration

3a. Describe the vacuum forming process and list 10 prosthetic/ orthotic devices obtained

from vacuum forming. b. Outline 10 fabrication techniques for composites c. Describe the extrusion process and outline 5 extrusion problems

4a. List different components of hip disarticulation prosthesis and describe how any 3 of the components can be produced.

b. Use diagram to describe partial hip replacement prosthesis and add a note on how it can be used

c. List different components of HKAFO and describe how any 3 of the components can be produced.