

**BACHELOR IN PROSTHETICS AND ORTHOTICS
FIRST YEAR
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE**

Q.P. Code: 802453

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Heat treatment of metals.
2. Classify leather on the basis of origin, grain pattern. Explain each in brief.
3. Special tools and equipment used in fabrication of Prostheses and Orthoses.

II. Write notes on: **(8 x 5 = 40)**

1. Biodegradable and Non-Biodegradable materials.
2. Work Bench Tools.
3. Wood Work in P and O.
4. Lathe Machine.
5. Tanning Process of Leather.
6. Fibre-Reinforced Plastics.
7. Safety Gadgets in Workshop.
8. Soldering and Brazing.

III. Short answers on: **(10 x 3 = 30)**

1. Smart Materials.
2. Hook Knife.
3. Ferrous Metal.
4. Torque Wrench.
5. Wood Preservation.
6. Sprit Level and Plumb Line.
7. Thermoforming Plastics.
8. Emery Sanding Cone.
9. Polyurethane Foam.
10. Chisels.

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Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Wood and types of wood.
2. Discuss the steps of converting raw hide / skin into leather.
3. Workshop Safety and Hazards and Care.

II. Write notes on: **(8 x 5 = 40)**

1. Surface coating of Metals.
2. Measuring Tools.
3. Fabric Material.
4. Drilling Machine.
5. Selection and Quality Control of Materials.
6. Compressors.
7. Plastic Moulding.
8. Gas Welding and Electric Arc Welding.

III. Short answers on: **(10 x 3 = 30)**

1. Biomaterials.
2. Types of Hammers.
3. Properties of Leather.
4. Bending Iron.
5. Pigment.
6. Deburring Tool.
7. Composite Materials.
8. Oscillating Saw.
9. Plaster of Paris.
10. Laser Line Alignment Apparatus.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321]

MARCH 2021

Sub. Code: 2453

(AUGUST 2020 EXAM SESSION)

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR (Regulation 2017-2018)

PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE

Q.P. Code : 802453

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Operation of Lathe Machine and its Types.
2. Types of Wood and Tools used for wood working.
3. Heat Treatment of Metal.

II. Write notes on:

(8 x 5 = 40)

1. Types of Measuring Tools.
2. Boring and Tapping operation using drilling machine.
3. Properties of Non - Ferrous Metals.
4. Properties of Polypropylene.
5. Polyurethane Foam uses in P & O.
6. Welding & Brazing process.
7. Operation of Electric Oven.
8. Types of Resins used in P & O.

III. Short answers on:

(10 x 3 = 30)

1. Different types of plastics used in P & O.
2. What do you mean by creep?
3. Types of Vice used in P & O workshop.
4. Properties of Aluminum.
5. Defects found in wood.
6. Merits and Demerits of foam.
7. Name few operations done using Milling machine.
8. What is soldering?
9. Thermoforming Plastics.
10. Power Hacksaw

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0422]

APRIL 2022

Sub. Code: 2453

(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR (Regulations 2017-2018)

PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE

Q.P NO. 802453

Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on : (3X10=30)

1. Types of metals and its classification, properties and usage in Orthotics.
2. Lathe Machine with sketch , parts function and usage.
3. Types of Measuring tools and its use in Prosthetics and Orthotics.

II. Write Notes on : (8X5=40)

1. Reinforced Plastic
2. Wood working tools.
3. Fabrics used in Prosthetics.
4. Plaster of Paris and its properties.
5. Differentiate between welding and soldering.
6. Pneumatic tools and its application in prosthetics.
7. Abrasive machine and its use.
8. Workshop accidents and safety.

III. Short Answers on : (10X3=30)

1. What is the difference between thermoplastic and thermosetting plastic?
2. List different types of files and its use.
3. What is the use of hot air gun in prosthetics?
4. Explain about the vice which is useful for prosthetic work.
5. What is the role of caliper in prosthetics work?
6. What is jig bending stirrup and its use in orthotics?
7. Define heat treatment of material
8. Write short note on leather and properties.
9. What do you mean by Elastomer and its use?
10. What are the fabrics used in prosthetic work?

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423]

APRIL 2023

Sub. Code: 2453

**BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE
Q.P. Code: 802453**

Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on : (3X10=30)

1. Operation of Drilling Machine and its types.
2. Types of Leathers and Chrome Tanning Process.
3. Types of Wood Joints.

II. Write Notes on : (8X5=40)

1. Types of Hand Tools.
2. Turning and Facing operation using Lathe.
3. Properties of Ferrous Metals.
4. Properties of Plaster of Paris.
5. Seasoning of wood.
6. Types of Foam used in P&O.
7. Plastic Welding process.
8. Operation of Compressor.

III. Short Answers on : (10X3=30)

1. Different types of metals used in P&O.
2. Stress and Strain curve for metals.
3. Different types of fabrics used in P&O.
4. Properties of Fiber Reinforced Plastics.
5. Properties of Polypropylene.
6. Merits and Demerits of Plastics.
7. Name few operations done using Lathe machine.
8. Why heat treatment of metal is needed and define annealing?
9. Explain about Hook's Law.
10. Draw Knife.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123]

NOVEMBER 2023

Sub. Code: 2453

**BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE
Q.P. Code: 802453**

Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on : (3X10=30)

1. Different types of hammers and its use with neat sketch.
2. Classification of plastic material and its properties.
3. Any five Special tools used in Prosthetics and Orthotics.

II. Write Notes on : (8X5=40)

1. Heat treatment of metals.
2. Wood and its types.
3. Leather and its properties.
4. Wood Working tools
5. Types of rivet and riveting failure.
6. Cutting tools and its usage.
7. Viscoelastic behavior of plastic.
8. Abrasive machine.

III. Short Answers on : (10X3=30)

1. What is Vernier caliper? Mention its use.
2. What is vacuum pump? Mention its use.
3. Write down the use of compressor in Prosthetics.
4. What is Vice? Write different types of vices.
5. Write about Jig bending stirrup.
6. Define Malleability.
7. What do you know about HDPE and its use in Prosthetics?
8. Dust Collection Equipment.
9. Differentiate between polymer and monomer.
10. What is sintering?

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424]

APRIL 2024

Sub. Code: 2453

**BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE
Q.P. Code: 802453**

Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on : (3 X 10 = 30)

1. Explain in detail about workshop safety, hazards and care.
2. Types of Fiber reinforced plastics and properties of Carbon reinforce plastics.
3. Describe leather, types and its tanning procedures.

II. Write Notes on : (8 X 5 = 40)

1. Surface coating of metals.
2. Explain the types of wood and the tools used for wood works.
3. Newton's Laws of Motion.
4. Power cutting tools used in P&O.
5. Materials and Techniques used for Lamination and Moulding in P & O.
6. What is meant by ductile materials?
7. Centre of Gravity.
8. Properties of leather.

III. Short Answers on : (10 X 3 = 30)

1. What is the chemical formula of Plaster of Paris?
2. Uses of resins in P & O application.
3. Ferrous and Non-ferrous metals.
4. Silicon.
5. Buckling.
6. H.D.P.E.
7. Grinding machine.
8. Welding.
9. Centroid.
10. Equilibrium.

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE
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Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on :

(3 X 10 = 30)

1. Different Types of files with diagram and usage.
2. Different types of cutting tools used in P & O application.
3. Lathe Machine and its various operations.

II. Write Notes on :

(8 X 5 = 40)

1. Surface coating of metals.
2. Mechanical working of metals.
3. Grinding machine and its uses.
4. Silicon and its properties with uses.
5. Polymer and its polymerization.
6. Various stages involved in annealing of metals.
7. Thermosetting plastic and its P & O application.
8. Explain the Hot air oven application in P & O field.

III. Short Answers on :

(10 X 3 = 30)

1. Difference between Ferrous and Non-ferrous Metals.
2. Soldering
3. Factor of Safety.
4. What is meant by ductile materials?
5. Different types of metals used in P & O.
6. Properties of Aluminum.
7. Chisel and its uses.
8. Plaster of Paris.
9. Types of leather.
10. Measuring tools.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1125]

NOVEMBER 2025

Sub. Code: 2453

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER III – WORKSHOP TECHNOLOGY AND MATERIAL SCIENCE
Q.P. Code: 802453

Time: Three Hours

Answer All questions

Maximum : 100 Marks

I. Elaborate on :

(3 x 10 = 30)

1. Operation of Milling Machine and its Types.
2. Classification of Metals
3. Differentiate Thermosetting and Thermoforming plastics and Properties of Polypropylene.

II. Write Notes on :

(8 x 5 = 40)

1. Types of Cutting Tools.
2. Lathe Machine.
3. Properties of Steel.
4. Properties of Copper.
5. HDPE (High-density Polyethylene) uses in P & O.
6. Soldering and Electoplasting process.
7. Operation of Vacuum Suction Machine.
8. Types of foams used in P & O.

III. Short Answers on :

(10 x 3 = 30)

1. Types of rivets used in P & O appliance.
2. What do you meant by Elasticity?
3. Types of Files used in P&O workshop.
4. Laminated Wood.
5. Annealing process.
6. List few Power Tools used in P&O workshop.
7. What is Polymerization?
8. Use of Silicone in P & O appliance.
9. Demerits of Plastics.
10. Jig saw.
