350: LEATHER TRADES

Examination Structure

This trade consists of THREE OPTIONS:

1. LEATHER TANNING OPTION
2. LEATHER GOODS MANUFACTURE
3. FOOTWEAR MANUFACTURE

The Trade Related subject is Building/Engineering Drawing

The General Education subjects are: English, Mathematics, Biology, Chemistry, Information and Communication Technology (ICT) and English Literature

EACH OPTION OF LEATHER TRADES comprises of the following modules:

351: LEATHER TANNING OPTION

i. Introduction to Hides and Skins .. .. CLM 11
ii. Principles of Leather Manufacture .. .. CLM 12
iii. Light and Heavy Leather Production .. .. CLM 13
iv. Leather Dyeing and Finishing .. .. .. CLM 14

352: LEATHER GOODS MANUFACTURE

i. Introduction to Leather Goods Manufacture .. CLG 11
ii Pattern Preparation .. .. CLG 12
iii Cutting and Skiving .. .. CLG 13
iv. Sewing .. .. CLG 14
v. Making and Finishing .. .. CLG 15

353: FOOTWEAR MANUFACTURE

i. Stitching .. .. CFM 13
ii. Footwear Bottom Preparation .. .. .. CFM 14
iii. Shoe Lasting .. .. CFM 15
iv. Sole Attaching .. .. CFM 16
v. Footwear Finishing .. .. CFM 17

EXAMINATION SCHEME

Each OPTION above, shall be examined in TWO papers:
ESSAY and PRACTICAL. This means there will be a PAPER 1 consisting of 40 objective and Five Essay question to answer Four in Two Hours Ten Minutes time.PAPER II shall be the PRACTICAL.

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S/No	Topic/Objectives	Contents	Activities/Remarks
1.0	**Hides and Skin** 1. List sources of hides and skin and explain their differences. 2. Explain the equipment used in slaughter slabs and abattoir and explain their uses.	1. Sources of hide and skin. 2. Cross-section of hide and skin. 3. Differences between hide and skin e.g. in size, area, weight, etc. 4. Care of animals prior to slaughter. 5. Value of hide and skin. 6. Damages on hides and skin during slaughter, flaying etc.	1. Practical slaughtering of animal involving various tools.
2.0	**Tools and Equipment for Slaughtering** 1. Identify tools and equipment used in slaughter slabs and abattoir and explain their uses.	1. Tools and equipment. 2. Uses of tools and equipment. 3. Maintenance of tools and equipment. 4. Slaughtering of animals.	1. Emphasis should be on different types of equipment.
3.0	**Trade Terms in Hides and Skin** 1. Explain the meaning of common trade terms and hides and skin regulations.	1. Common trade terms e.g. fell-mongering, hinny, kip, calf, etc. 2. Regulations for hides and skin.	
4.0	**Flaying, curing, & Storage** 1. Explain different methods of curing used in Nigeria and identify common commercial curing salts. 2. Explain the theory of salt penetration, importance and uses of arsenic solution. 3. Explain the use of insecticides and damages during storage.	1. Curing and flaying using flaying knives and machines. 2. Curing methods e.g. pickling, flinting, etc. 3. Curing with salt e.g. dry and wet salting. 4. Types of common curing salts e.g. fine salt, granular salt, etc. 5. Salt penetration. 6. Importance and uses of arsenic solutions. 7. Preparation of arsenic solution. 8. Uses(s) of insecticides	1. Practical involving various methods of preparation, curing and arsenic solutions.

S/No	Topic/Objectives	Contents	Activities/Remarks
		e.g. liquid insecticide, aerosol, etc. 9. Types of damages	
5.0	**Grading of Hides and Skin** 1. Differentiate between grading and selection in hides and skin. 2. Explain commercial classification, folding and banding of hides and skin.	1. Grading and selection in hides and skins. 2. Application of grading and selection. 3. Classification of hides and skin. 4. Folding and bunding.	1. Emphasis should be on folding, bunding an classification of hides and skin.

PRINCIPLES OF LEATHER MANUFACTURE

S/N	Topic/Objectives	Contents	Activities/Remarks
1.0	**Water for Tanning** 1. Identify the available sources of water supply, state the importance and explain the effect of hard water on tanning.	1. Sources of water. 2. Importance of water. 3. The effects of water. 4. Removal of water hardness.	1. Practical involving removal of water hardness
2.0	**Tannery Dyes, Finishes And Other Chemicals** 1. Name major vegetable tanning materials used in Nigeria and describe their sources. 2. Explain the basic principles of basicity of chrome liquors, the use and merits of oils, fats, waxes, and fat liquors in tanning. 3. list types of dyes and finishes, sources and explain the principles of fixation of dyes and finishes. 4. State the safety precautions to be observed in the use of acids, alkalis, salts, finishes, etc in the leather industry.	1 Vegetable tanning 2. Preparation of chrome liquors. 3. Principles of basicity. 4. Uses of oils, fats waxes, fat liquors and their merits. 5. Types of dyes and finishes. 6. Sources of dyes and finishes. 7. Factors governing the choice of dyes and finishes. 8. The principles of fixation. 9. Types and uses of indicators, PH papers, scales and buffer solutions in tanning. 10. Precautions in using acids, alkalis, salts and finishes.	1. Practical involving the preparation of tannery dyes, finishes, chrome liquors and other chemicals. 2. Precautions in handling alkalis, salts, finishes and other chemicals.
3.0	**Tannery Machines and Equipment** 1. List and identify tanning equipment and machines according to the production process and state safety precautions to be observed in their usage.	1. Types of Tanning equipment and machines. 2. Measurement of volumes, capacity of pit, drums and paddles. 3. Precautions for machines and equipment.	1. Emphasis on the care and uses of tannery machines and equipment.

S/N	Topic/Objectives	Contents	Activities/Remarks
4.0	**Outline of Leather Manufacture** 1. Outline the process of leather manufacture, different departments in the tanning industry and the manufacturing process of different types of leather uppers, soles, suede, etc. 2. Explain the operation of each of the departments and the different drying methods in leather manufacture.	1. Process of leather manufacture. 2. Types of departments in tanning e.g. beam yard, tan yard, etc. 3. Operation and functions of leather manufacture departments. 4. Dry methods in leather manufacture e.g. vacuum drying. 5. Manufacturing process of leather e.g. uppers, upholstery, suede, etc.	1. Emphasis on process and methods of leather manufacture.
5.0	**Quality Control in leather Manufacture** 1. Explain different quality control measures in the various processes of leather manufacture and the physical and chemical tests involved in the quality control of finished leather.	1. Quality control measures. 2. Physical and chemical tests in quality control. 3. Carrying out physical and chemical tests in quality control. 4. Similarities and differences in leather and leather substitutes.	Emphasis on: 1. Quality control measures The differences and similarities in leather and leather substitutes.

S/N	Topic/Objectives	Contents	Activities/Remarks
1.0	**Beam Yard Processes** 1. Explain the processes in a beam yard. 2. Select and weigh raw materials from light and heavy hides. 3. Soak raw hides in pits using given recipes, lime and unhair using different methods e.g. lime/sulfide system. 4. Delime using various deliming agents, drench, and degrease using various methods.	1. Processes in beam yard. 2. Selection of raw materials. 3. Weighing of raw materials. 4. Soaking raw hides in pits. 5. Liming and unhairing. 6. Rounding for heavy leather manufacture. 7. Deliming using various agents e.g. $(NH_4)_2SO_4$ 8. Bating and scudding. 9. Drenching. 10. Degreasing. 11. Picking.	1. Practical works involving beam yard processes, selection, weighing, soaking lining etc.
2.0	**Leather Tanning** 1. Interpret and asses already formulated recipes. 2. Tan to produce light leathers and specific tan parts of rounded hides to produce specific types of heavy leather e.g. for outer soles. 3. Apply post tanning processes and incorporate fats and fat-liquors into light leathers.	1. Interpret and assessing of formulated recipes. 2. Tanning to produce light leather using calf skins, sheep, goat, etc. 3. Tanning for specific leather. 4. Tanning of rounded parts of hides. 5. Application of post tanning processes. 6. Incorporation fat and fat-liquors. 7. Drying of light leather.	1. Practical work involving the various processes.
1.0	**Application of Dye Stuff, Pigments and Finishes.** 1. Dye various types of leather. 2. Apply dyeing processing to leather	1. Post tanning processes. 2. Dye solution and finishing dopes. 3. Dyeing processes using various dyes e.g. acid dyes, drum dyeing etc. 4. Dyeing of types of leather	1. Practical work involving dye stuff, pigments and finishes.

S/N	Topic/Objectives	Contents	Activities/Remarks
	using various dyes, pigments, using prepared dopes and apply post tanning processes before dyeing and finishing of leather. 3. Glaze or wet plate by machine.	e.g. suede leather. 5. Application of Pigments. 6. Spraying of top finish. 7. Glazing or wetting of plate.	
2.0	**Characteristics of Finished Leather** 1. Classify leather as soft, hard and list leather subset tubes explaining their advantages and disadvantages. 2. List and explain the properties/used of different types of fibre boards and adhesives used in leather goods manufacture. 3. Explain the advantages and disadvantages of using leather in making of shoes and other leather goods, and the principles of adhesion.	1. Classification of leather. 2. Leather substitutes, advantages and disadvantages. 3. Kinds of goods manufactured from leather. 4. Types of fibre boards and their properties. 5. Types of yarns, threads and uses. 6. Advantages and disadvantages of leather. 7. (a) Materials for re-enforcement. (b) Characteristics and uses. 8. a) Principles of adhesion. b) Types of adhesives.	1. Trainees are expected to know the differences and characteristics of kinds of goods manufactured from leather and leather substitute. 2. Trainees should be able to identify yarns, threads and their uses, types of adhesives, etc.

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S/No	Topic/Objectives	Contents	Activities/Remarks
1.0	**History and Development of leather** 1. List the origin, sources, types of leather used in the industry and explain their characteristics. 2. Outline the process of leather production with emphasis on lanning.	1. Origin of leather 2. Sources of leather 3. Process of leather production. 4. Types of leather and their characteristics.	
2.0	**Materials used in Leather Goods Manufacture** 1. Explain the structure of hides and skin, the characteristics and uses of plastics in the leather goods industry. 2. List leather substitutes enumerating their advantages and disadvantages different type of yarns and threads used in leather goods manufacture explaining their properties, and types of adhesives used in the leather works industry. 3. Explain the sources, properties and uses of dressing and finishing materials. 4. Explain the	1. Structure of hide and skin. 2. Leather substitutes. 3. Classification of leather. 4. Types of fibre boards and properties. 5. Types of yarns, threads and properties. 6. Structure of fabrics and uses . 7. Characteristics and uses of plastics. 8. Materials for reinforcement. 9. Sources, properties and uses of dressing and finishing materials. 10. Types of adhesives. 11. Principles of adhesion. 12. Selection of adhesive. 13. Application and effects of adhesive. 14. Cleaning materials. 15. Sources of cleaning materials, properties, actions and uses. 16. Types of dyes and pigments 17. Origin and composition of dyes and pigments.	1. Trainee should be able to identify various material used for leather goods.

S/No	Topic/Objectives	Contents	Activities/Remarks
	principles of adhesion, the criteria for selection of a particular types of adhesive for a particular purpose and the application and effects of adhesives. 5. Define “cleaning materials and list the sources, properties actions and state their uses. 6. List different types of dues and pigments used in leather work and explain the origin and composition.		

S/No.	Topic/Objectives	Comments	Activities/Remarks
1.0	**Instruments and Materials used in Pattern Preparation** 1. Identify instruments and materials used in pattern preparation, describing their uses. 2. Explain the safety precautions in the use of the instruments.	1. Instruments and materials in pattern preparation e.g. ruler or tape, pencil knife, etc. 2. Uses of instruments and materials. 3. Storage and care of instrument. 4. Precautions in using instrument.	1. Identification of instruments and materials used in pattern preparation.
2.0	**Pattern Production** 1. Sketch an item for manufacture inserting the measurements of various parts on the sketch, drawing the pattern to scale on cardboard and state the sequence of pattern cutting.	1. Sketching of item or product. 2. Measurement of an item. 3. Patten drawing to scale. 4. Sequence of pattern cutting e.g. form, cutting, standard making etc. 5. Cut patterns.	1. Measurement, free hand sketching and pattern drawing very essential.
3.0	**Application of Pattern** 1. Assemble patterns make corrections, estimate cost of materials and transfer test pattern to permanent pattern.	1. Assembling of patterns. 2. Correction of patterns. 3. Materials costing. 4. Transferring of test pattern to permanent pattern.	

S/No.	Topic/Objectives	Contents	Activities/Remarks
1.0	**Cutting and Skiving Tools and Equipment** 1. Identify all machines, equipment and hands tools used in cutting and skiving and explaining their safety precautions.	1. Machines, equipment and hand tools. 2. Maintenance of machines, tools and equipment. 3. Precautions in cutting and skiving.	1. Emphasis should be on safety tools and equipment maintenance.
2.0	**Principles of cutting & Skiving** 1. Explain the principles of hand cutting and select appropriate tools for usage. 2. Explain skiving and its purpose. 3. Distinguish between pattern areas and cutting area. 4. Operate skiving machines and carryout hand skiving.	1. Principles of hand cutting and hand skiving. 2. Tools for hand cutting and hand skiving. 3. Marking for cutting. 4. Inter-locking and pattern arrangement. 5. Hand cutting. 6. Machine cutting. 7. Pattern and cutting areas. 8. Skiving and purposes. 9. Operation of skiving machines. 10. Hand Skiving. 11. Measurement of leather.	

S/No	Topic/Objectives	Contents	Activities/Remarks
1.0	**Sewing Machine** 1. Identify common sewing machines, state their functions and explain their working principles. 2. Differentiate between manual and electric machines. 3. Clean, lubricate, change needles and thread and make necessary adjustment in a sewing machine.	1. Types of sewing machines. 2. Principles of sewing machines. 3. Manual and electric. 4. Functions of machines e.g. flat bed corner stitches, etc. 5. Attachments and functions. 6. Maintenance of sewing machines. 7. Threading and needling. 8. Machine Adjustment.	1. Identification of various types of sewing machines and their attachment.
2.0	**Preparation for Sewing** 1. Identify different types of needles, thread and select appropriate types for a job	1. Types of needles 2. Classification of threads 3. Adjustment of machine tension. 4. Selection of thread and needle. 5. Attachment for a job	1. Type and classification of needles, threads and attachments.
3.0	**Machine Sewing** 1. Operate sewing machines, identify sewing defects and correct them.	1. Machining sequences and procedures. 2. Operation of sewing machine. 3. Types of sewing defects and correction	1. Practical work involving machines sewing.
4.0	**Hand stitching** Explain hand stitching procedure and identify stitching faults by correcting them.	1. Hand stitching procedure. 2. Stitch length. 3. Tension for hand stitching. 4. (a) Types of stitching. (b) Faults and correction.	

353: FOOTWEAR MANUFACTURE: CFM 13, 14, 15, 16 & 17

S/No.	Topic/Objectives	Contents	Activities/Remarks
1.0	**Designing and Pattern Production** 1. Design and cut out the design. 2. Application of patterns.	1. Sequence of pattern cutting. 2. Grading of patterns	1. Practical activities in designing, forme cutting, standard making, Working patterns, Grading and Bottom patterns i.e. insole, sotes, heels.
2.0	**Pattern Preparation** 1. Cutting and skiving. 2. Safety involved in cutting	1. Method of cutting 2. Types of skiving 3. knowledge of material. 4. knowledge of safety precautions	1. Practical clicking of the upper materials, e.g. worp weft, and diagonal cutting. 2. Practical skiving including convex and concave, raw edge, lasting skive. 3. Practical involving safety precautions.
3.0	**Sewing Machine** 1. Identify sewing machines, attachment guides, stitching aids, types of needles and threads. 2. Explain the functions of preparation operation machines, types of sewing machines, stitch formation and working principles of machine for upper preparation. 3. Clean, lubricate, change needles and threads in sewing machines.	1. Preparation operations of sewing machines. 2. Function of preparation operation machines e.g. skiving machines, folding machines etc. 3. The functions of sewing machines e.g. flat bed, post bed, zig-zag etc. 4. Attachment guides, stitching aids and functions. 5. Stitch formation and adjustment e.g. stitch length, tension, etc. 6. Machine maintenance. 7. Types of needles. 8. Changing needles and threads. 9. Types of threads. 10. Principles of machines for upper preparation. 11. Principles of various sewing machines e.g. single needle flat-bed,	1. Practical involving sewing machine. Stitching aids. Machine maintenance etc.

S/No.	Topic/Objectives	Contents	Activities/Remarks
		twin-needle flat-bed, zig-zag.	
4.0	**Sewing Operation** 1. Explain and apply different method of sewing. 2. Assemble and decorate shoe uppers by using different methods of stitching.	1. Methods of sewing. 2. Assembling of upper components. 3. Ornamental stitches. 4. Shoe uppers operation e.g. edge trimming, edge pounding, eye lifting etc.	1. Emphasis on involving sewing machine, stitching aids, machine maintenance etc.
5.0	**Shoe Uppers** 1. Prepare shoe uppers following correct sequence.	1. Sequence in shoe upper preparation.	
6.0	**Tools and Equipment** 1. Identify machines, equipment and hand tools used in cutting and preparing shoe bottom components and explain the working principles of the machines. 2. Explain the safety precautions involved in cutting and preparing sole attachments.	1. Types of machines, equipment and hand tools. E.g. cutting press, cutting boards, etc. 2. Storage. Care, adjustment and maintenance of equipment and tools. 3. Precautions in cutting. 4. Functions and principle of machines.	1. Identification of machine tools, and tools and equipment, precaution and maintenance of equipment.
7.0	**Materials for Shoe Bottom** 1. Identify the different materials employed for shoe bottoming and shoe bottoming components.	1. Types of materials for shoe bottom e.g. leather plastics, etc. 2. Characteristics of materials. 3. Types of shoe bottoming components. 4. Materials for production.	1. Identification of various types of shoe bottom and materials for production.
8.0	**Cutting Materials Bottoming** 1. Explain the	1. Techniques of cutting. 2. Techniques of cutting by	1. Practical work involving techniques of

S/No.	Topic/Objectives	Contents	Activities/Remarks
	technique of cutting of maximum economy and of cutting economically all bottom parts form man-made materials.	hand and machine.	cutting.
9.0	**Preparation of Bottoming Parts** 1. Select the most suitable method and tools for roughing or preparing surface before adhesive application and explain the use and method of insole molding.	1. Methods and tools for roughing operation e.g. wire brush, abrasive paper etc. 2. Carrying out operation e.g. reducing insole and sole edge, insole covering, insole slotting etc. 3. Insole moulding, uses and method.	
10.0	**Tools and Equipment for Shoe Lasting** 1. Identify machines, equipment and hand tools used in shoe lasting. 2. Explain the safety precautions involved in using lasting equipment and machines, the functions and work principles of shoe lasting machines.	1. Types of machines in shoe lasting. 2. Maintenance of equipment. 3. Precautions in lasting equipment and machines 4. Functions and principles of machines.	
11.0	**Upper Lasting** 1. Explain the purpose of lasting and the different types of tacks and staples and their uses in lasting. 2. Enumerate and	1. Purpose(s) of lasting. 2. (a) Parts of a last. 3. (b) Methods of bottom metal plating. 4. Types of materials for stiffener and toe puff e.g. impregnated cloth etc.	1. Practical involving bottom metal plating heat treatment for materials before lasting. 2. Various techniques and lasting

S/No.	Topic/Objectives	Contents	Activities/Remarks
	explain different lasting techniques. 3. Identify different types of materials used for stiffener and toe puff. 4. Carry out lasting operations	5. Heat treatment for materials before lasting e.g. solvent activation. 6. Consequences of stress on upper materials. 7. Lasting techniques. 8. Lasting operation e.g. insole attaching, upper mulling, etc.	operations.
12.0	**Tools and Equipment for Upper Making** 1. Identify various machines, equipment and hand tools used in sole attaching. 2. Explain the safety precautions involved in using sole attaching equipment, the functions and working principles of the sole attaching machines.	1. Types of machines, equipment, and hand tool in sole attaching e.g. roughing machines etc. 2. Storage, care, adjustment and maintenance of machines and equipment. 3. Precautions in using equipment. 4. Functions and principles of machines.	1. Practical work involving tools and equipment for sole attaching.
13.0	**Preparation on Lasted Shoe** 1. Enumerate the difference between shank and bottom fillers and carry out lasted shoe operation.	1. Types of scouring abrasive, method and equipment for roughing. 2. Shank and bottom fillers. 3. Carrying out operations e.g. pounding of lasted shoe, roughing lasting margin. Etc.	1. Practical involving preparation on lasted shoe.
14.0	**Technique of Sole Attaching** 1. Identify different types of adhesives. Explain their uses and properties. 2. Explain how these adhesives should be stored and the	1. Types of adhesives, uses and properties. 2. Care and storage of adhesives. 3. Mechanism of adhesion and precautions. 4. Re-activation of adhesives.	1. Practical work involving the use of adhesives.

S/No.	Topic/Objectives	Contents	Activities/Remarks
	specific precautions to take when attaching sole to the lasted upper. 3. Carry out sole attaching operations.	5. Selection of adhesives. 6. Sole attaching operation e.g sole treatment, mockwell attaching etc.	
15.0	**Tools and Equipment for Shoe Finishing** 1. Identify machines, equipment and hand tools used for finishing operations, explaining their functions and working principles. 2. Explain the safety precautions involved in using the machines.	1. Types of machines, equipment and handtools for finishing operations e.g. trimming machine, scouring machine, etc. 2. Storage, care, adjustment and maintenance of machines and equipment. 3. Precautions in using machines and tools. 4. Functions and principles of machines.	1. Practical work involving adjustment and maintenance of machines.s
16.0	**Techniques of Sole and Heel Finishing** 1. Explain the difference between finishing the sole before attaching and finishing the sole after attaching. 2. Select edge trimming tools and heel scoring abrasives.	1. Methods of sole finishing. 2. Edge trimming tools. 3. Heel scouring abrasives, materials and equipment. 4. Operations for performance.	1. Practical work in sole and heel making
17.0	**Shoe Cleaning, Dressing and Packing** 1. Identify cleaning materials and types of shoe dressing products.	1. Types of cleaning materials e.g. solvent, detergent, etc. 2. a) Cleaning products. b) types of stains or spots. 3. Types of shoe dressing products e.g. polish, filler,	

S/No.	Topic/Objectives	Contents	Activities/Remarks
		waxes, etc. 4. Dressing products. 5. Operations for performance.	