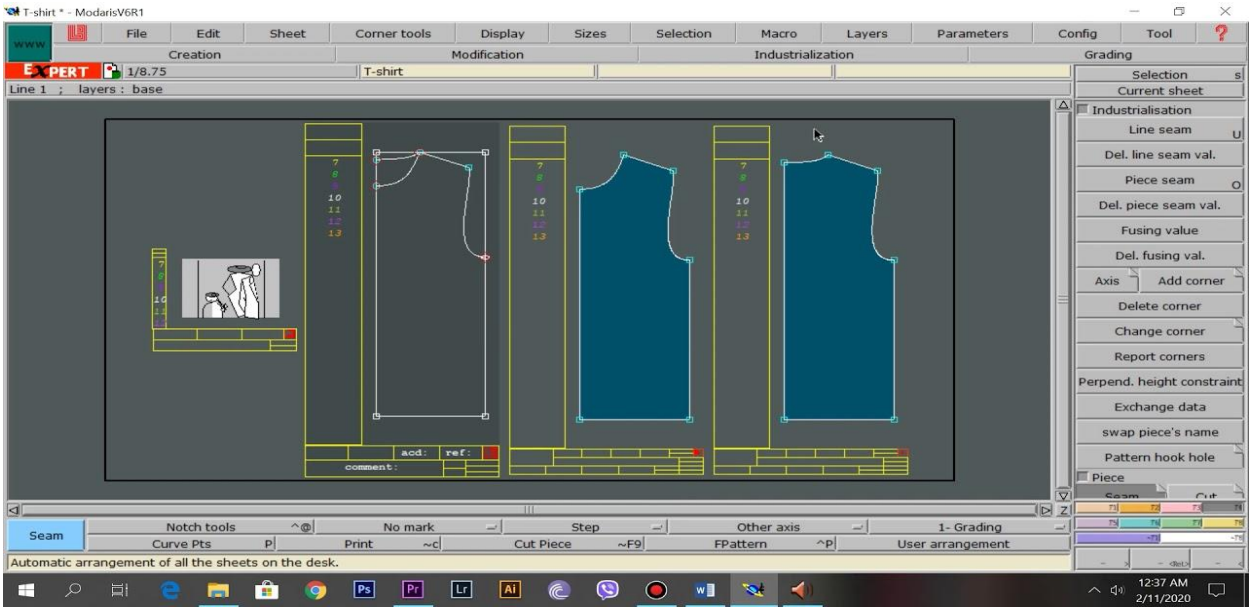
Garment Production

Level – III

Based on November, 2023 Curriculum Version II



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Acronym

2-D ---------- Two-Dimensional

3-D ----------Three-Dimensional

CAD ----------Computer-Aided Design

EPS ---------- Encapsulated PostScript.

PDF---------- Portable Document Format.

RAM ---------- Random Access Memory

TTLM ----------Teaching, Training and Learning Materials

Introduction to the Module

CAD systems are computer-aided design (CAD) software used in pattern production to create and modify garment patterns. They offer several advantages over traditional methods, including accuracy, speed, flexibility, creativity, and communication. CAD systems allow patternmakers to create precise measurements and dimensions, automate tasks like seam allowance calculations, and respond quickly to fashion trends or customer preferences. They also enable designers to explore new ideas and create complex designs. CAD patterns can be easily shared with other team members, such as sewers and manufacturers. Common applications include pattern creation, pattern modification, and pattern grading. CAD systems are used in various ways, including creating from scratch, modifying existing patterns, and grading patterns for different sizes.

This module is designed to meet the industry requirement under the Garment Production occupational standard, particularly for the unit of competency: Implement CAD System in pattern production.

Module covers the units:

- workstation
- Interpret the design
- Create block pattern
- Develop patterns
- Modify and finalize pattern
- Grade pattern
- Produce marker
- Complete work

Learning Objective of the Module

- Prepare workstation
- Interpret the design
- Create block pattern
- Develop patterns
- Modify and finalize pattern
- Grade pattern

- Produce marker
- Complete work

Module Instruction

For effective use this module trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” giver at the end of each unit and
5. Read the identified reference book for Examples and exercise

Unit One: Workstation and Design

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Set up Workstation
- Patternmaking tools and equipment
- design drawings and specifications
- Design lines and style features.
- Ease and seam allowance.
- Methods or trim details of garment

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Set up workstation according to OHS practices
- Select patternmaking tools and equipment
- Interpret and clarify design drawings and specifications
- Identify design lines and style features
- Obtain details of base size
- Determine ease and seam allowance
- Consider methods or trim details of garment in relation to the design

1.1 Set up Workstation

A workstation is a computer system designed for demanding technical or professional applications, typically with powerful hardware like faster processors, memory, and advanced graphics cards. It is used in various industries like engineering, design, media, and finance, running applications like CAD software, video editing, and financial modeling, and creating high-quality graphics and animations.

Workstations are essential tools in pattern production, used for creating and modifying garment patterns, 3D modeling, and visualization. They enhance the accuracy and efficiency of the patternmaking process by using powerful processors and graphics cards to handle complex CAD software. They also automate tasks like digitizing patterns and creating marker patterns, saving time and improving efficiency. Workstations also enhance creativity by allowing designers to explore new ideas and create complex designs. They also facilitate better communication by allowing patterns to be easily shared with other team members, such as seamstresses and manufacturers. Overall, workstations are a valuable tool for patternmakers and garment manufacturers to improve the accuracy, efficiency, creativity, and communication of their pattern production process.

To prepare a workstation for implementing a CAD system in pattern production, the following steps can be taken:

1) Choose a computer. The computer should have a powerful processor, plenty of RAM, and a good graphics card. This will ensure that the CAD software can run smoothly and efficiently.
2) Install the CAD software. Once you have chosen a computer, you will need to install the CAD software. This is usually a straightforward process, but you may need to contact the software vendor for assistance.
3) Configure the workstation. Once the CAD software is installed, you will need to configure the workstation. This includes setting up the display settings, keyboard shortcuts, and other preferences.
4) Install any necessary drivers. The CAD software may require you to install additional drivers for your hardware. Be sure to install all of the necessary drivers before you start using the CAD software.

5) Set up a workspace. You will need to set up a workspace for your CAD workstation. This includes providing a comfortable chair, a large monitor, and a good amount of desk space.

Setting up a workstation involves configuring and organizing a workspace for a specific purpose, such as implementing a CAD system in pattern production. This involves choosing the right hardware and software, and arranging the workspace ergonomically and efficiently.

1.2 Patternmaking Tools and Equipment

When implementing a CAD system in pattern production, it is important to select the right pattern making tools and equipment. The specific tools and equipment that are needed will vary depending on the specific CAD system that is being used, but some of the most common tools and equipment include:

a. **CAD software:** The CAD software that is used will determine the specific tools and equipment that are needed. Some CAD software programs come with a set of tools and equipment, while others require users to purchase their own tools and equipment.

b. **Digitizer:** A digitizer is a device that can be used to scan physical patterns into a CAD system. This can be useful for digitizing existing patterns or for creating new patterns from scratch.

c. **Plotter:** A plotter is a device that can be used to print patterns from a CAD system. This can be useful for printing out patterns for cutting or for creating patterns for other uses, such as grading or marker making.

d. **Pattern grading software:** Pattern grading software can be used to create patterns in different sizes. This can be useful for creating patterns for different garment sizes or for creating patterns for different brands.

e. **Marker making software:** Marker making software can be used to create efficient layouts of patterns on fabric. This can be useful for reducing fabric waste and for ensuring that patterns are cut accurately.

In addition to these basic tools and equipment, pattern makers may also need to use a variety of other tools and equipment, such as:

i. **Measuring tape:** A measuring tape is still needed for taking body measurements and garment dimensions, even when using CAD software.

ii. **Pencils and pens:** Pencils and pens are still needed for marking and drawing on patterns, even when using CAD software.

iii. **Rulers:** Rulers are still needed for measuring and marking lines on patterns, even when using CAD software.

iv. **Tailor's chalk:** Tailor's chalk is still needed for marking fabric and patterns, even when using CAD software.

The specific tools and equipment that are needed will vary depending on the specific CAD system that is being used and the preferences of the pattern maker. However, the tools and equipment listed above are the most common and essential tools for pattern making when using a CAD system.

Here are some additional tips for selecting pattern making tools and equipment for implementing a CAD system in pattern production:

- Choose a CAD system that is compatible with the tools and equipment that you already have. This will save you money on having to purchase new tools and equipment.
- Invest in a digitizer if you plan on digitizing existing patterns or creating new patterns from scratch.
- Purchase a plotter if you plan on printing out patterns for cutting or for creating patterns for other uses.
- Invest in pattern grading software if you plan on creating patterns in different sizes.
- Purchase marker making software if you plan on creating efficient layouts of patterns on fabric.

1.3. Design Drawings and Specifications

Patternmakers use CAD systems to interpret and clarify design drawings and specifications, focusing on the overall silhouette, specific details, desired fit, and fabric used. They use drawing tools to create a detailed technical sketch, patternmaking tools to create a technical pattern, and a prototype to test the fit and make necessary adjustments. Annotation tools and version control systems help track changes and ensure everyone is working on the same version of the design.

A garment specification sheet is a technical document that contains construction details, technical diagrams, and measurements. CAD software is used by engineers and designers to produce two-dimensional (2-D) drawings and three-dimensional (3-D) models, making designs simple to share, review, simulate, and edit. Fashion design consists of three main parts: style design, construction design, and process design. Fashion sketches, also known as production drawings or technical drawings, are used to express designers' ideas and garment details to related departments.

Professional knowledge in fashion design, such as aesthetics, ergonomics, and painting, is required for fashion sketch drawing. There are two methods for drawing fashion sketches: manual drafting and computer-aided drafting. Garment pattern making, also known as garment construction design or pattern cutting, is a crucial aspect of fashion design.

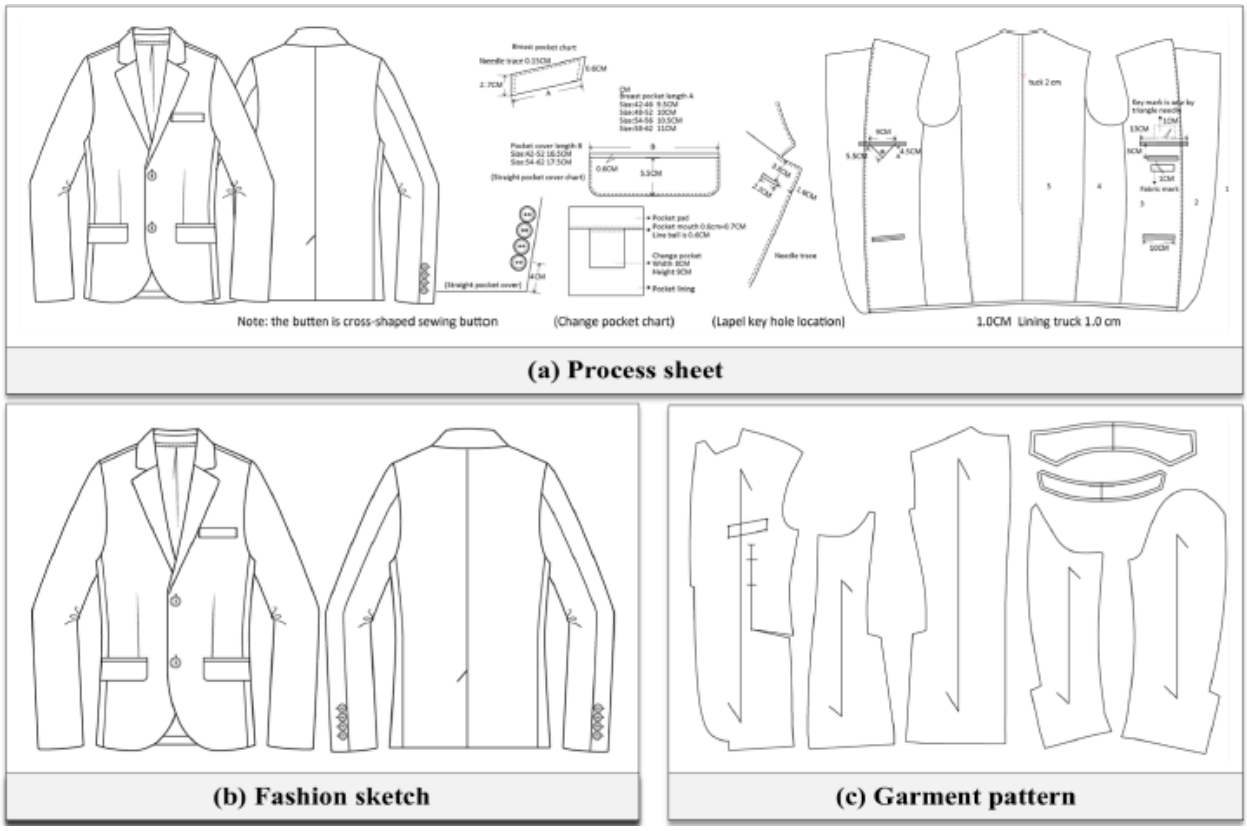


Figure 1.1: Fashion sketch, garment pattern and production sheet.

Pattern making is a crucial process in clothing manufacturing, involving drawing garment construction lines on brown paper and cutting them to create cloth pieces. Traditional hands-on methods and computer-aided methods are used, with designers creating sketches and pattern

makers based on customers' body dimensions. This process is time-consuming and inefficient, leading to the development of new technologies like 3D-to-2D flattening, 2D-to-3D virtual try-on and modeling, 3D-to-3D garment editing, parametric pattern making, and rapid fashion sketch generation. The modern textile sector produces various types of fabric, including woven, knit, and non-woven fabrics. Fabric width should be determined in detail before planning the cutting-marker, as the maximum width is constrained by the usable width of the fabric. Other important aspects include size and garment measurements, pattern details, seam allowances, design instructions, base size, and technical drawings.

1.4. Design Lines and Style Features

Design lines and style features in a CAD system are the key elements that define the look and feel of a garment. They can be simple or complex, and they can be used to create a variety of different effects.

Some common design lines and style features include:

- Neckline: The neckline is the opening at the top of the garment. It can be round, V-neck, square, or scoop, and it can be high, low, or asymmetrical.
- Sleeve: The sleeve is the part of the garment that covers the arm. Sleeves can be long, short, puffed, or cap-sleeved.
- Hemline: The hemline is the bottom edge of the garment. It can be straight, flared, or asymmetrical.
- Waistline: The waistline is the natural waistline, which is located at the narrowest part of the torso. The waistline can be defined with a belt, tuck, or seam.
- Bust line: The bust line is the fullest part of the chest. The bust line can be defined with a dart, seam, or pleat.
- In addition to these basic design lines, there are a number of other style features that can be used to create a unique look for a garment. These features may include:
- Lapels: Lapels are flaps of fabric that are attached to the collar of a jacket or coat.
- Pleats: Pleats are folds of fabric that are created by stitching the fabric together at regular intervals.

- Seams: Seams are lines of stitching that join two pieces of fabric together. Seams can be decorative or functional.
- Embellishments: Embellishments are decorative elements that are added to a garment, such as beads, sequins, or embroidery.

Patternmakers use CAD systems to identify and create design lines and style features. This allows them to create patterns that accurately reflect the designer's vision for the garment.

By following these tips, patternmakers can use CAD systems to identify design lines and style features more effectively and efficiently.

In addition to the above, here are some specific things that patternmakers can do to identify design lines and style features in a CAD system:

- Use the CAD system's library of garment blocks and patterns. This can be helpful for identifying the basic design lines and proportions of the garment.
- Use the CAD system's grading tools to create a range of sizes for the garment. This can be helpful for identifying how the design lines and style features will look on different body types.
- Use the CAD system's marker making tools to create efficient marker patterns for the garment. This can be helpful for identifying how the design lines and style features will be cut from fabric.

Base size

The details of a base size in CAD systems are the key dimensions of a pattern that define the garment's silhouette and fit. These dimensions may include the bust, waist, hip, shoulder, sleeve length, rise, and inseam, out seam, armhole depth, neckline depth, and hemline length. Patternmakers use these details to create a pattern that fits the desired body type and can be graded to create a range of sizes.

Using CAD systems allows patternmakers to quickly and easily obtain the details of a base size and create accurate and precise patterns. Examples of how the details of a base size can be used in a CAD system include creating a pattern with a specific amount of ease, defining the waistline, creating flared or straight skirts, fitting or relaxed bodices, and sleeve length dimensions.

To obtain the details of a base size in a CAD system, patternmakers can follow these steps:

1) Open the CAD system and load the base size pattern.

2) Use the CAD system's measurement tools to measure the key dimensions of the base size pattern.

3) Record the measurements in a spreadsheet or other document.

4) Use the CAD system's annotation tools to add notes and comments to the base size pattern.

5) Share the details of the base size pattern with the designer and other team members for feedback.

1.5. Ease and seam allowance

Ease and seam allowance are crucial concepts in CAD patternmaking, which are the amount of extra fabric added to a pattern to create a comfortable fit. Ease is typically measured as a percentage of the body measurement, while seam allowance is the amount of fabric added to allow for sewing and finishing the garment. Both are essential for creating garments that fit well and are easy to sew.

Ease can be added to a pattern in various ways, such as side seams, shoulder seams, or bust darts, depending on the garment's style and desired fit. It is typically added to all seams on the garment by drawing a line outside of the pattern pieces, parallel to the pattern piece edge and the desired width of the seam.

CAD systems can be used to add ease and seam allowance to patterns in various ways. Some have built-in tools for adding ease and seam allowance, while others require the patternmaker to manually add them. Examples of how ease and seam allowance can be used include creating a relaxed fit, fitted waistline, clean and professional seams, or specific seam finishes like surged or French seams.

Using CAD systems to add ease and seam allowance accurately and precisely can save time and effort, as well as create consistent and repeatable patterns. To determine ease and seam allowance in a CAD system, patternmakers should identify the garment's style and desired fit, consult with the designer or other team members, use the CAD system's measurement tools to measure key dimensions of the base size pattern, use the CAD system's ease calculator to

determine the amount of ease needed, and add the ease and seam allowance to the pattern pieces by drawing lines outside of the pattern piece edges.

1.6. Methods or Trim Details of Garment

Methods and trim details of a garment in relation to the design in a CAD system refer to the specific techniques and embellishments used to create the garment. These details can include construction methods, finishing methods, decoration methods, and trim details. To consider these details, patternmakers should open the CAD system and load the garment pattern.

Using annotation tools, they can add notes and comments to the garment pattern, documenting the different methods and trim details being considered. Visualization tools can be used to visualize different methods and trim details on the garment, such as simulation tools or creating prototypes with different methods and trim details. Feedback from the designer and other team members can also be obtained by sharing the CAD system files or creating physical prototypes.
Optimizing the methods and trim details for the fabric used to make the garment can be done by considering the fabric's properties, such as weight, drape, and stretch.

To effectively and efficiently consider methods and trim details of a garment in relation to the design in a CAD system, patternmakers should use annotation tools to document the different methods and trim details, visualize them to see how they affect the overall look and feel of the garment, get feedback from the designer and other team members, and optimize the methods and trim details for the fabric to ensure a good fit and drape. By following these tips, patternmakers can use CAD systems to consider methods and trim details of a garment in relation to the design more effectively and efficiently.
Patternmakers can use CAD systems to consider garment methods and trim details in relation to the design. They can use the CAD system's library of garment blocks and patterns to obtain basic garment dimensions and recommended methods and trim details. The system's grading tools can create a range of sizes for the garment, verifying that the methods and trim details are appropriate for all sizes. The system's marker making tools can create efficient marker patterns for the garment, ensuring efficient and cost-effective use of methods and trim details. By utilizing CAD systems, patternmakers can consider garment methods and trim details more effectively, leading to better fitting and stylish garments.

SELF CHECK - ONE

PART ONE: TRUE/FALSE QUESTIONS

1. The workstation should be placed in a well-lit area with good ventilation.

2. The monitor should be placed at eye level, so that you don't have to tilt your head up or down to look at it.

3. The keyboard and mouse should be placed at a comfortable height, so that your wrists are not bent at an awkward angle.

4. The chair should be adjustable, so that you can find a comfortable position.

5. You should take breaks every 20-30 minutes to avoid eye strain and fatigue.

6. It is important to carefully interpret and clarify design drawings and specifications before starting to work on a pattern in CAD.

7. Design lines and style features are important elements of a garment design that should be carefully considered when creating a pattern in CAD.

8. The base size of a garment is the size of the garment without any ease or seam allowance.

9. Ease and seam allowance are added to the base size to create a wearable garment.

10. Methods or trim details of a garment design, such as darts, pleats, and gathers, should be considered when creating a pattern in CAD.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. What is the best height for a monitor when using CAD

a) At eye level b) Slightly below eye level c) Slightly above eye level

2. Which of the following is NOT an important factor to consider when setting up a workstation for CAD?

a) Lighting
b) Monitor placement
c) Keyboard and mouse placement
d) Room temperature

3. Why is it important to take breaks when using CAD?

a) To avoid eye strain and fatigue
b) To improve circulation
c) To reduce stress
d) All of the above

4. Which of the following is a common pattern making tool used in CAD?

a) Digitizer
c) Scissors
b) Plotter
d) All of the above

5. What is the benefit of using CAD for pattern making?

a) Accuracy
c) Versatility
b) Efficiency
d) All of the above

6. Which of the following is NOT an important step in interpreting and clarifying design drawings and specifications?

a) Reading the drawings carefully and identifying all relevant information.

b) Asking the designer clarifying questions if needed.

c) Creating a list of all the materials and tools required to make the garment.

d) Making any necessary assumptions about the designer's intent.

7. Which of the following is a common design line or style feature that should be considered when creating a pattern in CAD?

A. Seam placement
C. Pleat placement
B. Dart placement
D. All of the above

8. How can you obtain the details of the base size for a garment?

A. Use a standard size chart.

B. Take body measurements from the intended wearer.

C. Look for the base size information in the design drawings or specifications.

D. All of the above

9. What is the purpose of adding ease and seam allowance to a pattern?

A. To create a wearable garment that allows for movement and comfort.

B. To compensate for sewing inaccuracies.

C. Both A and B

D. Neither A nor B

10. When considering methods or trim details of a garment design in relation to the pattern, what is an important factor to keep in mind?

A. The type of fabric being used.

B. The construction techniques required to achieve the desired effect.

C. The skill level of the person who will be sewing the garment.

PART THREE: SHORT ANSWER QUES

1. What are some important factors to consider when setting up a workstation for CAD?
2. Why is it important to take breaks when using CAD?
3. What are some common pattern making tools and equipment used in CAD?
4. What are the benefits of using CAD for pattern making?

Unit Two: Create Block pattern

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Block pattern.
- Block Patterns with CAD system.
- Alteration in design specifications.

This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Determine appropriate block for the development of pattern.
- Produce block Patterns with CAD system.
- Make alteration in according to design specifications.

2.1 Block Pattern

Block patterns are basic garment patterns created using computer-aided design (CAD) systems. They serve as the foundation for other patterns and are based on body type measurements. CAD systems offer advantages over traditional drafting methods, allowing patternmakers to create block patterns quickly and accurately, and can be used for various body types. They are a valuable tool for creating garment patterns.

To create a block pattern in a CAD system, the patternmaker will typically use the following steps:

1. Load the garment block template. The garment block template is a basic pattern that provides the foundation for the block pattern.
2. Measure the key dimensions of the garment block template. This may include the bust, waist, hip, shoulder, and sleeve length.
3. Use the CAD system's drafting tools to create the block pattern. This may involve drawing lines, arcs, and circles.
4. Add notes and comments to the block pattern. This can be helpful for documenting the changes that have been made to the garment block template.
5. Save the block pattern file.

Benefits of creating a block pattern in a CAD system:

a. **Accuracy:** CAD systems can help patternmakers to create block patterns that are very accurate. This is because CAD systems allow patternmakers to use precise measurement tools and drafting tools.

b. **Consistency:** CAD systems can help patternmakers to create block patterns that are consistent. This is because CAD systems allow patternmakers to use the same measurement tools and drafting tools every time, they create a block pattern.

c. **Efficiency:** CAD systems can help patternmakers to create block patterns more efficiently. This is because CAD systems automate many of the tasks involved in creating a block pattern.

d. **Flexibility:** CAD systems can help patternmakers to create block patterns that are flexible. This is because CAD systems allow patternmakers to easily make changes to the block pattern.

Overall, creating a block pattern in a CAD system can offer a number of advantages over traditional drafting methods. CAD systems can help patternmakers to create block patterns that are accurate, consistent, efficient, and flexible.

Pattern markings：

- Appropriate seam allowance
- Notching
- Pattern information (size, style number, cutting instructions and identity)
- Darts
- Drill holes
- Grain line
- Stitching line

The choice of pattern block in a CAD system depends on the type of garment being created. Common blocks include:

i. **Basic block**: serves as the foundation for all other garment patterns,
ii. **Sleeve block:** creates sleeves based on arm measurements and desired sleeve style,
iii. **Waistband block**: creates waistbands based on waist measurements and desired style,
iv. **Skirt block:** creates skirts based on hip measurements and desired style,
v. **Pants block:** creates pants for garments based on waist, hips, and thighs measurements and desired style.

These blocks are designed to create a cohesive and effective design for garments.

A patternmaker selects a block from a CAD system and uses its drafting tools to create a garment pattern. The pattern is based on the block pattern but modified to achieve the desired style. Examples of blocks used include basic blocks for basic dresses, sleeve blocks for fitted shirts, waistband blocks for skirts, skirt blocks for flared skirts, and pants blocks for jeans. These blocks can be used to create various garment styles, such as basic dresses, fitted sleeve shirts, flared skirts, and pants blocks for jeans.

Patternmakers can use CAD systems to develop patterns for various garments, saving time and money while ensuring accurate and well-fitting garment patterns. Other blocks can be used for specialized garments like swimwear, outerwear, and lingerie. To determine the

appropriate block for pattern development, patternmakers should consider factors such as the type of garment, desired style, and wearer's body type.

To select the appropriate block, patternmakers should consult with the designer or team members, review the garment specification sheet, use the CAD system's library of blocks, and experiment with different blocks. Consultation with the designer or team members can help identify specific requirements for the garment style. The garment specification sheet may list the specific blocks required for the garment, while the CAD system's library may have blocks for specific garment styles. Experimenting with different blocks can also help identify the best block for the pattern.

Additionally, patternmakers can use the CAD system's grading tools to create a range of sizes for the block pattern, ensuring that the block pattern can be used for garments for various body types. Additionally, using the CAD system's marker making tools can create efficient marker patterns for the block pattern, ensuring that the block pattern is used efficiently and cost-effectively.

In summary, patternmakers can use CAD systems to develop patterns for various garments by considering factors such as garment type, desired style, and wearer's body type. By following these tips, patternmakers can ensure accurate and well-fitting garment patterns.

2.2 Block Patterns

Patterns like trousers, skirt, and shirt, jacket which include sleeves, collars, buttons, zips, and pockets.

To produce block patterns with a CAD system, the patternmaker can follow these steps:

1) Open the CAD system and load the garment block template. The garment block template is a basic pattern that provides the foundation for the block pattern.
2) Measure the key dimensions of the garment block template. This may include the bust, waist, hip, shoulder, and sleeve length.
3) Use the CAD system's drafting tools to create the block pattern. This may involve drawing lines, arcs, and circles.

4) Add notes and comments to the block pattern. This can be helpful for documenting the changes that have been made to the garment block template.

5) Save the block pattern file.

Here are some specific tips for producing block patterns with a CAD system:

- Use the CAD system's measurement tools to measure the key dimensions of the garment block template accurately. This will help to ensure that the block pattern is accurate and precise.
- Use the CAD system's drafting tools to create the block pattern carefully. Make sure that the lines, arcs, and circles are drawn accurately and precisely.
- Use the CAD system's annotation tools to document the changes that have been made to the garment block template. This can be helpful for communicating with the designer and other team members.
- Save the block pattern file in a format that is compatible with the CAD system that will be used to create the garment pattern. This will help to ensure that the block pattern can be easily imported into the garment pattern software.

By following these tips, patternmakers can use CAD systems to produce block patterns that are accurate, precise, and easy to use.

In addition to the above, here are some specific things that patternmakers can do to produce block patterns with a CAD system:

- Use the CAD system's grading tools to create a range of sizes for the block pattern. This can help to ensure that the block pattern can be used to create garments for a variety of body types.
- Use the CAD system's marker making tools to create efficient marker patterns for the block pattern. This can help to ensure that the block pattern is used in a way that is both efficient and cost-effective.
- Use the CAD system's simulation tools to visualize the block pattern on a virtual model. This can help to identify any areas that need to be adjusted.

2.3 Alteration in Design Specifications

Modifying a garment pattern to meet design specifications involves altering the fit, style, or construction of the garment to meet the specific requirements of the garment design.

Patternmakers use a variety of techniques to make alterations in garment patterns, including:

a. **Moving lines:** This may involve moving the grainline, centerline, or bustline of the pattern.

b. **Adding or removing darts:** Darts are used to create shaping in garments. Patternmakers may add or remove darts to create the desired fit or style.

c. **Changing the seam allowances:** Seam allowances are the extra fabric that is added to the pattern to allow for stitching and finishing. Patternmakers may change the seam allowances to accommodate different sewing techniques or to create a different look.

d. **Adding or removing details:** Patternmakers may add or remove details such as pockets, collars, or sleeves to create the desired style of garment.

Patternmakers use CAD systems to make alterations in garment patterns quickly and accurately. CAD systems provide a number of features that can be helpful for making alterations, such as:

i. **Drafting tools:** CAD systems provide a variety of drafting tools that can be used to move lines, add or remove darts, and change seam allowances.

ii. **Grading tools:** CAD systems can be used to grade the altered pattern to all sizes. This can help to ensure that the garment will fit a variety of body types.

iii. **Marker making tools:** CAD systems can be used to create efficient marker patterns for the altered pattern. This can help to ensure that the fabric is used in a way that is both efficient and cost-effective.

iv. **Simulation tools:** CAD systems can be used to visualize the altered pattern on a virtual model. This can help to identify any areas that need to be adjusted.

By taking advantage of the features and capabilities of CAD systems, patternmakers can make alterations in garment patterns quickly and accurately. This can help to ensure that the garment patterns meet the design specifications and that the garments will fit well.

Here are some specific examples of how CAD systems can be used to make alterations in

By using CAD systems to make alterations in garment patterns, patternmakers can save time and create patterns that are more accurate and precise. This can lead to better fitting garments for their customers.

To make alterations in a garment pattern according to design specifications, patternmakers can use a CAD system to follow these steps:

1) Open the CAD system and load the garment pattern.
2) Review the design specifications. This will help to identify the desired changes to the garment pattern.
3) Use the CAD system's drafting tools to make the necessary alterations to the garment pattern. This may involve moving lines, adding or removing darts, or changing the seam allowances.
4) Add notes and comments to the garment pattern. This can be helpful for documenting the changes that have been made.
5) Save the garment pattern file.

Here are some specific tips for making alterations in a garment pattern according to design specifications:

- Be sure to review the design specifications carefully. This will help to ensure that the necessary changes are made to the garment pattern.
- Use the CAD system's drafting tools to make the necessary alterations accurately and precisely.
- Add notes and comments to the garment pattern to document the changes that have been made.
- Save the garment pattern file in a format that is compatible with the CAD system that will be used to create the garment.
- In addition to the above, here are some specific things that patternmakers can do to make alterations in a garment pattern according to design specifications:

- Use the CAD system's grading tools to make the necessary alterations to all sizes of the garment pattern. This can help to ensure that the garment pattern will fit a variety of body types.
- Use the CAD system's marker making tools to create efficient marker patterns for the garment pattern. This can help to ensure that the garment pattern is used in a way that is both efficient and cost-effective.
- Use the CAD system's simulation tools to visualize the garment pattern on a virtual model. This can help to identify any areas that need to be adjusted.

By taking advantage of the features and capabilities of CAD systems, patternmakers can make alterations in garment patterns quickly and accurately. This can help to ensure that the garment patterns meet the design specifications and that the garments will fit well.

Here are some specific examples of how CAD systems can be used to make alterations in garment patterns according to design specifications:

- A patternmaker could use a CAD system to make alterations to a basic dress pattern to create a flared dress pattern.
- A patternmaker could use a CAD system to make alterations to a sleeve block pattern to create a fitted sleeve pattern.
- A patternmaker could use a CAD system to make alterations to a waistband block pattern to create a belted waistband pattern.
- A patternmaker could use a CAD system to make alterations to a skirt block pattern to create a tiered skirt pattern.

SELF CHECK -TWO

PART ONE: TRUE/FALSE QUESTIONS

1. It is important to select the appropriate block for the development of a pattern in order to achieve the desired fit and style.
2. A sloper is a basic block pattern that can be used to create a variety of other garment patterns.
3. A CAD system can be used to create and edit block patterns quickly and accurately.
4. When making alterations to a block pattern, it is important to consider the design specifications of the garment.
5. A CAD system can be used to make alterations to block patterns quickly and easily.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. Which of the following is the most important factor to consider when selecting the appropriate block for the development of a pattern?

(A) The desired fit and style of the garment.
(B) The type of fabric being used.
(C) The skill level of the person who will be sewing the garment.
(D) All of the above.

2. What is a slope?

(A) A basic block pattern that can be used to create a variety of other garment patterns.

(B) A type of fabric that is often used for making garments.

(C) A tool that is used to sew seams.

(D) None of the above.

3.What is the benefit of using a CAD system to produce block patterns?

(A) It is quick and accurate.

(B) It can help to create complex patterns.

(C) Both A and B.

(D) Neither A nor B.

4. When making alterations to a block pattern, what is it important to consider?

(A) The design specifications of the garment.

(B) The type of fabric being used.

(C) The skill level of the person who will be sewing the garment.

(D) All of the above.

PART THREE: SHORT ANSWER QUES

1. What is the benefit of using a CAD system to make alterations to block patterns

Unit Three: Develop patterns

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Software's.
- Advanced Pattern-making principles.
- Pattern with design requirements
- Checking, labelling and completing Pattern pieces
- Document methods and formulas

This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Identify appropriate software's.
- Identify and apply advanced Pattern-making principles.
- Produce pattern with design requirements.
- Check labelling and completing Pattern pieces.
- Document methods and formulas used.

3.1. Software's

Developing patterns by CAD is the process of using a computer-aided design (CAD) system to create a blueprint for a garment. This blueprint includes all of the necessary information to create the garment, such as the shape of the garment, the size of the garment, and the placement of the seams.

CAD systems provide a number of features that can be helpful for developing patterns, such as:

- Drafting tools: CAD systems provide a variety of drafting tools that can be used to create and modify block patterns.
- Grading tools: CAD systems can be used to grade block patterns to all sizes.
- Marker making tools: CAD systems can be used to create efficient marker patterns from fabric.
- Simulation tools: CAD systems can be used to visualize the garment pattern on a virtual model. This can help to identify any areas that need to be adjusted.

  To develop patterns by CAD, patternmakers typically follow these steps:

1. Open the CAD system and load the block pattern.
2. Use the CAD system's drafting tools to make any necessary alterations to the block pattern.
3. Use the CAD system's grading tools to grade the modified block pattern to all sizes.
4. Use the CAD system's marker making tools to create efficient marker patterns from the graded block pattern.
5. Save the graded block pattern and marker patterns.

By following these steps, patternmakers can develop patterns quickly and accurately by CAD. This can help to ensure that the garment patterns meet the design specifications and that the garments will fit well.

Here are some specific examples of how CAD can be used to develop patterns:

- A patternmaker could use CAD to develop a basic dress pattern from a block pattern.
- A patternmaker could use CAD to develop a fitted sleeve pattern from a sleeve block pattern.
- A patternmaker could use CAD to develop a belted waistband pattern from a waistband block pattern.
- A patternmaker could use CAD to develop a tiered skirt pattern from a skirt block pattern.
- A patternmaker could use CAD to develop a cropped pants pattern from a pants block pattern.

By using CAD to develop patterns, patternmakers can save time and create patterns that are more accurate and precise. This can lead to better fitting garments for their customers.

In addition to the above, CAD systems can also be used to develop patterns for more complex garments, such as those with multiple pieces or unusual shapes. CAD systems can also be used to develop patterns for garments that are made from special materials, such as leather or fur.

Overall, CAD is a powerful tool that can be used to develop patterns for a wide variety of garments. CAD systems can help patternmakers to save time, create more accurate and precise patterns, and develop patterns for more complex garments.

3.2. Advanced Pattern-making principles

CAD systems are a powerful tool for patternmakers to apply advanced pattern-making principles. They enable the creation of complex and sophisticated garment shapes, such as asymmetrical garments, garments with multiple seams, and garments with unusual curves. These patterns can be graded more accurately than manual methods, ensuring that the garments fit well on various body types. CAD systems also create more efficient marker patterns, which can reduce fabric waste and save money.

Visualizing garment patterns on virtual models helps patternmakers identify any areas that need adjustment. For example, a patternmaker could use CAD systems to create a garment with a complex asymmetrical shape, a garment with tailored seam allowances, a garment with a fitted bodice and flared skirt, a garment with a wide range of sizes with greater accuracy than manual grading methods, a marker pattern for a garment with multiple pieces that is more efficient than a marker pattern created manually, and a garment pattern that needs to be visualized on a virtual model to identify any areas that need to be adjusted.

In addition to these applications, CAD systems can also be used to create garments with special features, such as pleats, gathers, darts, seams, and closures. Pleats can be created using various techniques, such as knife pleats, box pleats, and cartridge pleats. Gathers can be created using shirring, smocking, and ruching, while darts can be created using different shapes and sizes. Seams can be created using princess seams, dart seams, and French seams, and closures can be created using zippers, buttons, and snaps. By understanding and applying these principles, patternmakers can create garments with a wide range of special features.

3.3. Pattern with design requirements.

To produce a pattern with design requirements means to create a garment pattern that meets the specific requirements of the garment design. This includes the shape of the garment, the type of fabric it will be made from, and the desired fit.

CAD systems can be used to produce patterns with design requirements by incorporating CAD pattern-making techniques. These techniques can be used to create complex garment shapes, special features, and custom fits.

Here are some examples of design requirements that can be met using CAD systems:

- Asymmetrical shape: A CAD system can be used to create a garment with an asymmetrical shape, such as a peplum dress or a wrap skirt.
- Multiple seams: A CAD system can be used to create a garment with multiple seams, such as a princess seam dress or a tailored jacket.
- Unusual curves: A CAD system can be used to create a garment with unusual curves, such as a bell-shaped skirt or a peplum top.
- Special features: A CAD system can be used to create garments with special features, such as pleats, gathers, darts, seams, and closures.
- Custom fit: A CAD system can be used to create patterns that are tailored to the individual needs of the wearer. By understanding and applying CAD pattern-making techniques, patternmakers can use CAD systems to produce patterns with design requirements to create garments that are both stylish and functional.

Here are some specific examples of how CAD systems can be used to produce patterns with design requirements:

- A patternmaker could use a CAD system to create a garment with a flared skirt. This would involve using dart manipulation and seam allowances to create the flared shape.
- A patternmaker could use a CAD system to create a garment with a princess seam construction. This would involve using princess seams to create a fitted garment that flatters the wearer's figure.

- A patternmaker could use a CAD system to create a garment with a custom fit. This would involve using the CAD system's grading tools to create a pattern that is tailored to the individual needs of the wearer.

3.4. Pattern Pieces

CAD systems can be used to check, label, and complete pattern pieces in a number of ways.

Checking pattern pieces

CAD systems can be used to check pattern pieces for accuracy and completeness. This can be done by using the CAD system's measurement tools to compare the pattern pieces to the garment design specifications. The CAD system can also be used to check for any errors in the pattern pieces, such as missing seams or incorrect markings.

Labeling pattern pieces

CAD systems can be used to label pattern pieces with the necessary information, such as the size, piece name, and directions. This information can be added to the pattern pieces automatically, or it can be added manually by the user.

Completing pattern pieces

CAD systems can be used to complete pattern pieces by adding seam allowances, hem allowances, and facing allowances. This can be done automatically, or it can be done manually by the user.

Here are some specific examples of how CAD systems can be used to check, label, and complete pattern pieces:

- A patternmaker could use a CAD system to check a pattern piece for accuracy by comparing it to the garment design specifications. The patternmaker could use the CAD system's measurement tools to measure the length, width, and other dimensions of the pattern piece. The patternmaker could then compare these measurements to the garment design specifications to see if there are any discrepancies.
- A patternmaker could use a CAD system to label a pattern piece with the necessary information by automatically adding the size, piece name, and directions to the pattern piece. The patternmaker could also manually add this information to the pattern piece if desired.

- A patternmaker could use a CAD system to complete a pattern piece by automatically adding seam allowances, hem allowances, and facing allowances. The patternmaker could also manually add these allowances to the pattern piece if desired.

By using CAD systems to check, label, and complete pattern pieces, patternmakers can save time and improve the accuracy of their work.

In addition to the above, CAD systems can also be used to automate a number of other tasks related to pattern piece checking, labeling, and completion. For example, CAD systems can be used to:

- Generate reports that identify any errors or inconsistencies in the pattern pieces.
- Generate labels for the pattern pieces with the necessary information.
- Generate cutting patterns from the pattern pieces. By automating these tasks, CAD systems can help patternmakers to streamline their workflow and produce more accurate and complete pattern pieces.

3.5. Document methods and formulas

CAD systems use a variety of methods and formulas to create and manipulate garment patterns. Some of the most common methods and formulas include:

a. **Drafting:** Drafting methods are used to create basic pattern pieces from scratch. These methods are based on mathematical principles and are used to create patterns that are accurate and consistent.

b. **Grading:** Grading methods are used to create patterns that fit a range of sizes. These methods are based on mathematical formulas that take into account the differences in body proportions between different sizes.

c. **Marker making:** Marker making methods are used to create efficient cutting patterns from pattern pieces. These methods are based on mathematical formulas that take into account the fabric waste that is generated when cutting out patterns.

In addition to these common methods and formulas, CAD systems may also use a variety of other methods and formulas to create and manipulate garment patterns. For example, CAD systems may use methods and formulas to:

- Add seam allowances and hem allowances to pattern pieces.
- Notch pattern pieces.
- Generate reports that identify any errors or inconsistencies in the pattern pieces.
- Generate cutting patterns from the pattern pieces.

CAD systems use mathematical principles to create and manipulate garment patterns. They use methods and formulas based on mathematical principles, such as drafting for a basic sleeve pattern, grading for a sleeve pattern that fits various sizes, and marker making for an efficient cutting pattern. These methods enable accurate and efficient creation and manipulation of garment patterns. CAD system documentation typically provides information about these methods and formulas, which can be helpful for patternmakers who want to understand how CAD systems work and how to use them effectively. For example, a drafting method can create a basic sleeve pattern from scratch, while a grading method can create a sleeve pattern that fits various sizes.

SELF CHECK- THREE

PART ONE: TRUE/FALSE QUESTIONS

1. There are many different CAD software programs available, and the best one for a particular task will depend on the specific needs of the user.
2. Advanced pattern-making principles can be used to create complex and unique patterns.
3. When producing a pattern with design requirements, it is important to consider the type of fabric being used, the desired fit, and the construction techniques required.
4. Checking labeling and completing pattern pieces is an important step in ensuring the accuracy of the pattern.
5. Documenting methods and formulas used is a good practice for keeping track of the pattern creation process and for sharing the pattern with others.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. Which of the following is an important factor to consider when choosing CAD software for pattern making?

(A) The type of patterns you will be creating (C) Your budget

(B) Your skill levels (D) All of the above

2. What is an example of an advanced pattern-making principle?

(A) Dart manipulation (B) Pleating (C) Gathering (D) All of the above

3. When producing a pattern with design requirements, what is it important to consider?

(A) The type of fabric being used
(C) The construction techniques required
(B) The desired fit
(D) All of the above

4. What is the purpose of checking labeling and completing pattern pieces?

(A) To ensure the accuracy of the pattern
(C) Both A and B
(B) To make it easier to sew the garment
(D) Neither A nor B

5. Why is it important to document the methods and formulas used to create a pattern?

(A) To keep track of the pattern creation process
(B) To share the pattern with others
(C) Both A and B
(D) Neither A nor B

PART THREE: SHORT ANSWER QUESTIONS

1) What are some factors to consider when choosing CAD software for pattern making?
2) What are some of the most popular CAD software programs for pattern making?
3) What are some examples of advanced pattern-making principles?
4) How can advanced pattern-making principles be used to create unique and innovative designs?
5) What are some important factors to consider when producing a pattern with design requirements?

Unit Four: Modify And Finalize Pattern

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Modifications tools in software.
- Design modification requirements.
- Check Pattern pieces accuracy
- Label pattern information's.

This unit will also assist you to attain the learning outcomes stated in the cover page.
Specifically, upon completion of this learning guide, you will be able to:

- Identify modifications tools in software.
- Perform modifications in according to design requirements.
- Check Pattern pieces for accuracy of seam and ease allowances, seam match, hems and functional openings.
- Complete and assessing pattern alterations to meet fit and design.
- Check and finalize pattern to ensure completeness and compliance to design.
- Label pattern information's.

4.1 Modifications Tools in Software

CAD systems can be used to modify pattern pieces by adding, subtracting, or moving material. This can be done to create different garment shapes, to accommodate different body types, or to make adjustments for different fabric types.

Here are some specific examples of how CAD systems can be used to modify pattern pieces:

- A patternmaker could use a CAD system to add a dart to a pattern piece to create a fitted garment.
- A patternmaker could use a CAD system to subtract material from a pattern piece to create a looser-fitting garment.
- A patternmaker could use a CAD system to move material from one part of a pattern piece to another to create a different garment shape.

Finalizing pattern pieces

CAD systems can be used to finalize pattern pieces by adding seam allowances, hem allowances, and facing allowances. This can be done automatically, or it can be done manually by the user.

Here are some specific examples of how CAD systems can be used to finalize pattern pieces:

- A patternmaker could use a CAD system to automatically add seam allowances to all of the pattern pieces in a garment.

- A patternmaker could use a CAD system to manually add hem allowances to the bottom of a skirt pattern piece.
- A patternmaker could use a CAD system to manually add facing allowances to the neckline of a blouse pattern piece.

By using CAD systems to modify and finalize garment patterns, patternmakers can save time and improve the accuracy of their work.

In addition to the above, CAD systems can also be used to automate a number of other tasks related to pattern modification and finalization. For example, CAD systems can be used to:

- Generate reports that identify any errors or inconsistencies in the pattern pieces.
- Generate labels for the pattern pieces with the necessary information.
- Generate cutting patterns from the pattern pieces.

CAD systems automate tasks, streamlining the workflow for patternmakers and enabling more accurate and finalized pattern pieces. CAD system documentation provides detailed instructions on how to modify and finalize garment patterns, aiding those interested in learning how to use CAD systems for improved workflow and finalized pattern pieces.

CAD systems offer a variety of tools for modifying garment patterns. Some of the most common modification tools include:

- Dart manipulation: Dart manipulation tools allow patternmakers to add, subtract, or move darts. This can be used to create different garment shapes, to accommodate different body types, or to make adjustments for different fabric types.
- Seam allowance tools: Seam allowance tools allow patternmakers to add or remove seam allowances from pattern pieces. This can be used to create different garment finishes or to accommodate different fabric types.
- Hem allowance tools: Hem allowance tools allow patternmakers to add or remove hem allowances from pattern pieces. This can be used to create different garment lengths or to accommodate different fabric types.
- Facing allowance tools: Facing allowance tools allow patternmakers to add or remove facing allowances from pattern pieces. This can be used to create different garment finishes or to accommodate different fabric types.

- Notching tools: Notching tools allow patternmakers to add or remove notches from pattern pieces. This is necessary for assembling garments correctly.
- Marker making tools: Marker making tools allow patternmakers to create efficient cutting patterns from pattern pieces. This can help to reduce fabric waste and save time.

In addition to these common modification tools, CAD systems may also offer a variety of other tools for modifying garment patterns. For example, some CAD systems offer tools for:

- Adding or removing pleats
- Adding or removing gathers
- Adding or removing pockets
- Adding or removing zippers
- Adding or removing other garment features

The specific modification tools that are available in a CAD system will vary depending on the specific software package. However, all CAD systems offer a variety of tools that can be used to modify garment patterns accurately and efficiently.

CAD system documentation typically includes information about the modification tools that are available in the CAD system. This information can be helpful for patternmakers who want to learn how to use the CAD system to modify garment patterns.

Here are some specific examples of how CAD modification tools can be used in pattern production:

- A patternmaker could use dart manipulation tools to add darts to a pattern piece to create a fitted garment.
- A patternmaker could use seam allowance tools to add seam allowances to all of the pattern pieces in a garment.
- A patternmaker could use hem allowance tools to add hem allowances to the bottom of a skirt pattern piece.
- A patternmaker could use facing allowance tools to add facing allowances to the neckline of a blouse pattern piece.
- A patternmaker could use notching tools to add notches to all of the pattern pieces in a garment.
- A patternmaker could use marker making tools to create an efficient cutting pattern from the pattern pieces in a garment.

4.2 Design Modification Requirements

To perform modifications in accordance with design requirements using CAD software, follow these steps:

1. Identify the design requirements. What are the specific requirements for the garment? What kind of shape does it need to have? What kind of fabric will it be made from?
2. Research CAD pattern-making techniques. There are a number of CAD pattern-making techniques that can be used to create different garment shapes. Research these techniques to find the ones that are best suited for the garment design requirements.

3. Use the CAD software to modify the pattern pieces. Use the CAD software's modification tools to add, subtract, or move material from the pattern pieces to create the desired garment shape.
4. Check the modified pattern pieces for accuracy and completeness. Make sure that the modified pattern pieces are the correct size and shape, and that they have all of the necessary markings.
5. Finalize the modified pattern pieces by adding seam allowances, hem allowances, and facing allowances. This can be done automatically, or it can be done manually by the user.

Here are some specific examples of how to perform modifications in accordance with design requirements using CAD software:

- To create a fitted garment, a patternmaker could use dart manipulation tools to add darts to the pattern pieces.
- To accommodate a different body type, a patternmaker could use seam allowance tools to add or remove seam allowances from the pattern pieces.
- To make adjustments for a different fabric type, a patternmaker could use hem allowance tools to add or remove hem allowances from the pattern pieces.
- To add a pleat to a garment, a patternmaker could use the CAD software's pleat creation tool.
- To add a pocket to a garment, a patternmaker could use the CAD software's pocket creation tool.

By following these steps, patternmakers can use CAD software to perform modifications in accordance with design requirements accurately and efficiently.

It is important to note that CAD software is a tool, and it is up to the patternmaker to use the tool effectively. Patternmakers need to have a good understanding of pattern-making principles in order to use CAD software to create accurate and wearable garment patterns.

4.3 Check Pattern Pieces Accuracy

To verify the accuracy of pattern pieces in a CAD system for seam and ease allowances, seam match, hems, and functional openings, follow these steps:

1. Check seam and ease allowances. Use the CAD system's measurement tools to measure the seam and ease allowances on all of the pattern pieces. Make sure that they are consistent with your design specifications.
2. Check seam match. Place the pattern pieces together at the seams and make sure that they match up exactly. You can use the CAD system's overlay function to do this.
3. Check hems. Measure the hems on all of the pattern pieces to make sure that they are the correct length.
4. Check functional openings. Measure all of the functional openings on the pattern pieces, such as necklines, waistbands, and armholes. Make sure that they are the correct size and shape.

Here are some specific things you can look for when checking the accuracy of pattern pieces in a CAD system:

- Seam allowances: Make sure that the seam allowances are consistent on all of the pattern pieces and that they match your design specifications.
- Seam match: Make sure that all of the seams match up exactly when the pattern pieces are placed together.
- Hems: Make sure that all of the hems are the correct length.
- Functional openings: Make sure that all of the functional openings are the correct size and shape.
- Notches: Make sure that all of the notches are in the correct place and that they match up on the corresponding pattern pieces.
- Grain lines: Make sure that all of the grain lines are aligned correctly.

You can also use the CAD system's grading tools to check the accuracy of your graded patterns. Grading is the process of resizing a pattern for different sizes. To check the accuracy of your graded patterns, you can compare the seam lengths and hem lengths of the different sizes. You can also compare the placement of the notches and grain lines.

Once you have checked the accuracy of all of your pattern pieces, you can be confident that your garment will fit well and sew up smoothly.

Here are some additional tips for checking the accuracy of pattern pieces in a CAD system:

- Use the CAD system's layers function to keep your pattern pieces organized. This will make it easier to find and measure specific pattern pieces.
- Use the CAD system's zoom function to get a closer look at the pattern pieces. This can be helpful for checking the accuracy of small details, such as notches and grainlines.
- Print out the pattern pieces and check them manually. This can be a good way to catch any errors that you may have missed when checking the pattern pieces on the computer.

5.4 Complete and assess pattern alterations to meet fit and design.

To complete and assess pattern alterations to meet fit and design in a CAD system, you can follow these steps:

1. Identify the areas of the pattern that need to be altered. This may include the length, width, or overall shape of the garment.
2. Make the necessary alterations to the pattern in the CAD system. You can use the CAD system's tools to add or remove seams, adjust the size of notches, and move grainlines.
3. Assess the fit and design of the altered pattern. You can do this by placing the altered pattern pieces on a dress form or by draping them on your own body. Make any necessary adjustments to the pattern until you are satisfied with the fit and design.

Here are some specific tips for completing and assessing pattern alterations in a CAD system:

- Use the CAD system's layers function to keep your original pattern pieces separate from the altered pattern pieces. This will make it easier to go back to the original pattern if needed.
- Use the CAD system's grading tools to grade your altered patterns. This will ensure that your altered patterns fit different sizes accurately.
- Print out the altered pattern pieces and check them manually. This can be a good way to catch any errors that you may have missed when checking the pattern pieces on the computer.

Once you are satisfied with the fit and design of your altered pattern, you can cut out the pattern pieces and start sewing!

Here are some additional tips for assessing the fit and design of altered patterns:

- Consider the overall silhouette of the garment. Does the garment have the desired shape and drape?
- Check the fit of the garment at key points, such as the bust, waist, and hips. Are the seams aligned correctly? Is the garment comfortable to wear?
- Make sure that the functional openings of the garment are the correct size and shape. For example, the neckline should not be too tight or too loose, and the armholes should allow for enough movement.

To finalize a pattern in a CAD system, follow these steps:

1. Check for missing pattern pieces. Ensure all garment pattern pieces are present and accounted for.

2. Check the accuracy of pattern pieces using the CAD system's measurement tools. Ensure they are consistent with design specifications.

3. Check the overall design of the pattern. Ensure the pattern pieces fit correctly and the garment's silhouette aligns with your vision.

4. Make any necessary adjustments to the pattern. If errors or inconsistencies are found, make them using the CAD system's tools.

5. Finalize the pattern. Once satisfied with the accuracy and completeness, save it as a final version.

Tips for checking and finalizing a pattern in a CAD system include using the layers function to organize pattern pieces, using the zoom function to examine small details like notches and grainlines, printing out and checking them manually to catch errors.

Lastly, seek feedback from experienced seamstresses or tailors to identify potential problems and make suggestions for improvement.

4.4. Label Pattern Information's

In a CAD (Computer-Aided Design) system, label pattern information refers to the data and specifications related to the creation and placement of labels on garments. CAD systems are used in the fashion industry to design and develop garments, including the labeling elements.

Here are some common aspects of label pattern information in a CAD system:
Label Shape and Size: The CAD system allows designers to define the shape and size of the label. This can range from simple rectangular labels to more complex shapes, depending on the design requirements.

Label Placement: Designers can specify the exact location where the label should be placed on the garment. This includes determining the position on the garment (e.g., front, back, collar) and the specific coordinates for accurate placement.

Label Graphics: CAD systems enable designers to incorporate graphics, such as brand logos, symbols, or text, into the label design. The system may provide tools for creating or importing these graphics.

Label Stitching Lines: CAD systems can generate stitching lines or markers that indicate where the label should be attached or sewn onto the garment. These lines ensure precise and consistent placement during the manufacturing process.

Label Text and Information: Designers can input text and information that should appear on the label, such as brand names, care instructions, fabric composition, or size information. The CAD system may provide options for different fonts, sizes, and formatting.

Label Color and Background: The CAD system allows designers to specify the color of the label itself and the background on which the label will be placed. This helps visualize how the label will appear against the garment fabric.

Label Variations: If there are multiple variations of labels for different garment sizes or styles, the CAD system can facilitate creating and managing these variations, ensuring accuracy and consistency across the designs.

By incorporating label pattern information into a CAD system, designers can visualize how the labels will look on the garment, ensure precise placement, and communicate the label design specifications to manufacturers accurately.

SELF CHECK- FOUR

PART ONE: TRUE/FALSE QUESTIONS

1) Most CAD software programs have tools that can be used to modify patterns.
2) It is important to carefully consider the design requirements before making any modifications to a pattern.
3) When checking pattern pieces for accuracy, it is important to check for seam and ease allowances, seam match, hems, and functional openings.
4) Pattern alterations should be completed and assessed to ensure that they meet the desired fit and design.
5) Before finalizing a pattern, it is important to check and ensure that it is complete and complies with the design specifications.
6) Pattern information, such as the designer's name, the pattern number, and the size, should be labeled on all pattern pieces.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. Which of the following is a common modification tool found in CAD software?
(A) Move tool (B) Scale tool (C) Rotate tool (D) All of the above

2. What is the most important factor to consider when making modifications to a pattern?
(A) The design requirements (B) The type of fabric being used (C) The skill level of the person who will be sewing the garment (D) All of the above

3. When checking pattern pieces for accuracy, what is the most important thing to look for?
(A) Seam and ease allowances (B) Seam match points (C) Hems and functional openings (D) All of the above

4. What is the purpose of completing and assessing pattern alterations?
(A) To ensure that the alterations meet the desired fit and design (B) To troubleshoot any problems that may arise (C) Both A and B (D) Neither A nor B

5. What is the most important thing to check before finalizing a pattern?

(A) Completeness (B) Compliance with design specifications (C) Both A and B (D) Neither A nor B

6. What information should be labeled on all pattern pieces?
(A) Designer's name (B) Pattern number (C) Size (D) All of the above

PART THREE: SHORT ANSWER QUESTIONS

1. How does using a CAD system for modifying patterns offer advantages over traditional manual pattern adjustments in terms of accuracy and efficiency?
2. Describe the key steps involved in modifying a pattern using a CAD system, from making design changes to finalizing the adjusted pattern.
3. Discuss the role of digital pattern manipulation tools in a CAD system and how they enable designers to easily modify pattern shapes, sizes, and proportions.
4. Explain the process of grading patterns in a CAD system and how it contributes to creating size variations for different body types.
5. How does the visualization capability of a CAD system assist in evaluating and refining pattern modifications before finalizing them for production?
6. Discuss the importance of collaborating with pattern makers and other stakeholders during the pattern modification process in a CAD system.
7. Explain the significance of accurate pattern finalization in terms of achieving proper fit, ensuring production efficiency, and minimizing errors during garment construction.
8. How does a CAD system facilitate the documentation and storage of pattern modifications, ensuring version control and traceability throughout the pattern production process?
9. Share insights on how a CAD system enables designers to generate technical specifications and instructions for pattern production, ensuring consistency and clarity in the manufacturing process.
10. Discuss any challenges or considerations that designers may encounter when finalizing patterns in a CAD system and strategies to address them effectively.

Unit Five: Grade Pattern

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- CAD grading system.
- Base size measurements and subsequent spread.
- Grade increments between sizes.
- Grade points or lines.

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify grading system used in CAD.
- Identify measurements of base size and subsequent spread.
- Determine number of sizes in grading.
- Establish grade increments between sizes.
- Identify stacking grade points or lines.
- Grade pattern using patternmaking technical skills on computer.
- Preserve integrity of pattern attributes.
- Label all pattern pieces with pattern marking symbols.
- Check and rectify pattern.
- Document graded patterns.

5.1. CAD Grading System

Grading a pattern in CAD is the process of resizing it for different sizes. This is done by adjusting the seam allowances and increasing or decreasing the size of the pattern pieces. Grading a pattern is important because it ensures that your garment will fit well on a variety of body types.

To grade a pattern in a CAD system, you will need to:

1. Open the pattern file in the CAD system.
2. Select the pattern pieces that you want to grade.
3. Use the CAD system's grading tools to adjust the size of the pattern pieces.
4. Save the graded pattern file.

There are two main types of grading in CAD:

- Proportional grading: This type of grading adjusts the size of all of the pattern pieces proportionately. This means that the overall shape of the garment remains the same, but the size of the garment is adjusted.
- Differential grading: This type of grading adjusts the size of different pattern pieces by different amounts. This is useful for grading patterns for garments that have different body proportions, such as women's and men's clothing.

Most CAD systems have a variety of grading tools available, so you can choose the method that is most appropriate for your needs.

Here are some tips for grading patterns in CAD:

- Use a grading chart to help you determine the correct size adjustments for each pattern piece.
- Grade the pattern pieces in a logical order. For example, you might want to start with the bodice pieces and then grade the sleeve pieces and skirt pieces.

- Check the fit of the graded pattern pieces by placing them on a dress form or by draping them on your own body. Make any necessary adjustments to the pattern pieces until you are satisfied with the fit.

Grading patterns in CAD can be a time-consuming process, but it is worth the effort to ensure that your patterns fit well and produce garments that look great.

There are two main grading systems used in CAD:

- Manual grading: This is the traditional method of grading patterns. It involves manually adjusting the seam allowances and increasing or decreasing the size of the pattern pieces.
- Automatic grading: This is a newer method of grading patterns that uses CAD software to automatically adjust the pattern pieces to the specified size range.

Automatic grading is the most common grading system used in CAD today. It is faster and more accurate than manual grading, and it allows you to grade patterns for a wider range of sizes.

To identify the grading system used in a CAD system, you can look for the following features:

- Manual grading: If the CAD system has tools for manually adjusting the seam allowances and increasing or decreasing the size of the pattern pieces, then it is using manual grading.
- Automatic grading: If the CAD system has tools for automatically grading patterns for a specified size range, then it is using automatic grading.

The CAD system's documentation can be consulted to determine its grading system.

Here are some additional tips for identifying the grading system used in a CAD system:

- Check the CAD system's toolbar for grading tools. If the CAD system has a toolbar with grading tools, then it is most likely using automatic grading.
- Check the CAD system's menu options for grading commands. If the CAD system has a menu with grading commands, then it is most likely using automatic grading.

- Consult the CAD system's documentation. The CAD system's documentation should explain how to grade patterns using the CAD system.

5.2. Base Size Measurements and Subsequent Spread

To identify the measurements of the base size and subsequent spread by CAD, follow these steps:

1) Open the pattern file in the CAD system,
2) Select pattern pieces for the base size,
3) Use the CAD system's measurement tools to measure the key dimensions of the pattern pieces,
4) Record the measurements in a spreadsheet or table, and
5) Repeat steps 2-4 for subsequent sizes.

Key dimensions to measure include bust, waist, hips, length, sleeve length, shoulder width, armhole depth, and neckline width. Calculate the spread between the sizes by subtracting the base size measurement from the subsequent size measurement. Repeat this process for each dimension to calculate the spread between the sizes.

To grade your pattern for different sizes, use the CAD system's layers function to keep pattern pieces separate, measure the key dimensions to the nearest 1/8 inch, and record the measurements in a spreadsheet or table. For beginners, online tutorials and resources can help, or experienced seamstresses or tailors can provide assistance. This process can help you create a well-rounded pattern for different sizes.

To determine the number of sizes in grading in CAD, follow these steps:

1. Open the pattern file in the CAD system.
2. Select pattern pieces for the base size.
3. Use the CAD system's measurement tools to measure the key dimensions of the pattern pieces.
4. Record the measurements in a spreadsheet or table.
5. Repeat steps 2-4 for subsequent sizes.
6. Calculate the spread between the sizes for each dimension by subtracting the measurement for the base size from the measurement for the subsequent size.

A good rule of thumb is to grade your pattern for at least three sizes. If designing for a wide range of sizes or a garment typically offered in a wide range, you may want to grade for more sizes.

Additional tips for determining the number of sizes in grading in CAD include using the CAD system's layers function to keep pattern pieces separate, measuring key dimensions to the nearest 1/8 inch, recording measurements in a spreadsheet or table, and considering the size range of your target audience and the type of garment you are designing.

5.3. Grade Increments Between Sizes

To establish grade increments between sizes by CAD system, follow these steps:

1. Choose your CAD system, such as Grafis, Lectra, or Gerber.

2. Create a grading chart, which lists the grade increments for each size based on body measurements of different sizes.

3. Import your pattern into the CAD system, either by scanning or digitizing it with a digitizer.

4. Define your grading points, which are key points on the pattern used to calculate the grade increments. You can define them manually or use the CAD system's automatic grading point placement tools.

5. Apply the grading rules, which tell the CAD system how much to increase or decrease each grading point for each size. You can use pre-programmed grading rules or create your own custom grading rules.

6. Generate the graded patterns, which will create a new pattern for each size based on the specified grade increments.

Additional tips for establishing grade increments between sizes by CAD system include using a grading chart appropriate for the type of garment, considering the ease of the garment when determining grade increments, using the CAD system's grading tools to preview the graded patterns, and testing the graded patterns on a sample garment before sewing the final garment.

Examples of grade increments for different types of garments include women's tops (bust: 1 inch, waist: 1/2 inch, hip: 1 inch, length: 1/4 inch), men's shirts (chest: 1 inch, waist: 1/2 inch, length:

1/4 inch), men's pants (waist: 1 inch, hip: 1 inch, length: 1/2 inch), and children's clothing (all measurements: 1/2 inch).

5.4. Grade Points or Lines

To identify stacking grade points or lines in CAD, you can use the CAD system's grading tools, which highlight overlapping grade points or lines. Open the CAD system and import your pattern, select the grading tools from the toolbar, and click and drag over the area where you think the stacking grade points or lines are located. The CAD system will highlight the overlapping grade points or lines.

To use the CAD system's layer visibility, open the system and import your pattern, then turn off the visibility of all layers except for the grading layer. This will make it easier to see the overlapping grade points or lines.

If the grading tools or layer visibility are not available, manually inspect the grade points or lines by zooming in on the area where you think the stacking grade points or lines are located. Use the CAD system's selection tools to select the grade points or lines, and if they are overlapping, you can select them both.

Once you have identified the stacking grade points or lines, correct them by moving one of the grade points or lines out of the way. You can also use the CAD system's grading tools to adjust the grade increments for the affected grade points or lines.

Additional tips for identifying stacking grade points or lines in CAD include looking for grade points or lines that are overlapping or touching each other, looking for grade points or lines on different layers, using the CAD system's zoom and selection tools more closely, and trying to move an overlapping grade point or line out of the way to see if there is another underneath it.

To grade a pattern using pattern making technical skills on a computer, follow these steps:

1. Choose your CAD system (computer-aided design) and import your pattern.

2. Identify the grading points on the pattern to calculate grade increments.

3. Apply the grading rules to the CAD system, which will tell it how much to increase or decrease each grading point for each size. You can use pre-programmed grading rules or create your own custom rules.

4. Preview the graded patterns to identify potential problems with the grading.

5. Generate the graded patterns once you are satisfied with the graded patterns. The CAD system will create a new pattern for each size based on the specified grade increments.

Additional tips for grading a pattern using pattern making technical skills include using a grading chart appropriate for the type of garment being made, considering the ease of the garment when setting grade increments, using the CAD system's grading tools to preview the graded patterns before generating them, and testing the graded patterns on a sample garment before sewing the final garment.

Examples of how to use pattern making technical skills to grade a pattern on a computer include selecting dart points and the dart seam, increasing or decreasing the dart points and the dart seam by the appropriate grade increments, ensuring alignment and smoothness of the dart points and seam, grading a neckline by the neckline edge, and grading a sleeve by the sleeve cap, hem, and seam.

There are many other ways to grade patterns, and the specific steps will vary depending on the type of garment and the style of the pattern.

To maintain the integrity of pattern attributes in CAD, use layers to organize patterns and separate different attributes. Groups can group pattern pieces for specific sizes or attributes for a specific piece. Blocks are useful for creating reusable patterns and attributes, such as a sleeve block for various garment patterns. Templates can be used to create new patterns and attributes with consistent settings, such as a template for a new pattern piece that includes the default layer, group, and block settings. A pattern grading system can also be used to ensure that pattern attributes are preserved when grading a pattern, automatically updating grading points and seam allowances. These steps help maintain the integrity of pattern attributes in CAD.

To label pattern pieces with pattern marking symbols in CAD, follow these steps:

1. Open the CAD system and import your pattern.

2. Select the pattern pieces you want to label.
3. Use the CAD system's text tool to add the pattern marking symbols to the pattern pieces.
4. Use the CAD system's alignment tools to align the pattern marking symbols correctly.
5. Repeat steps 3 and 4 for all of the pattern pieces that you want to label.

Additional tips for labeling all pattern pieces with pattern marking symbols include using a consistent font and size, placing the symbols in a location where they will be easy to see and understand, using the CAD system's layer visibility to turn off the visibility of the pattern marking symbols when not in use, and making sure to label all of the pattern pieces, even if the pattern marking symbols are self-explanatory.

Examples of how to label pattern pieces with pattern marking symbols in CAD include:

1. Labeling a dart: Select the dart points and the dart seam.
2. Use the CAD system's text tool to add the text "Dart" to the dart points.
3. Align the text "Dart" so it is centered between the dart points.
4. Labeling a neckline: Select the neckline edge.
5. Use the CAD system's text tool to add the text "Neckline" to the neckline edge.
6. Labeling a sleeve: Select the sleeve cap, sleeve hem, and sleeve seam.
7. Use the CAD system's alignment tools to center the text "Sleeve" along the sleeve cap, sleeve hem, and sleeve seam.

There are many other ways to label pattern pieces with pattern marking symbols, depending on the type of garment and the style of the garment.

To check and rectify a pattern in CAD, follow these steps:

1) Open the CAD system and import your pattern.

2) Inspect the pattern for any errors, such as overlapping or intersecting pattern pieces, missing or duplicate pattern pieces, incorrect seam allowances, incorrect grading, or incorrect pattern marking symbols.

3) Use the CAD system's tools to rectify any errors found.

4) Preview the pattern to ensure all errors have been fixed.

5) Generate the corrected pattern.

Additional tips for checking and rectifying a pattern in CAD include using the CAD system's layer visibility to turn on and off different layers of the pattern, using zoom and selection tools to inspect the pattern in detail, using grading tools to check the grading of the pattern, and using the pattern marking symbol tool to check the pattern marking symbols.

Examples of checking and rectifying pattern errors in CAD include checking for overlapping or intersecting pattern pieces, missing or duplicate pattern pieces, incorrect seam allowances, incorrect grading, and incorrect pattern marking symbols. To ensure accuracy, use the CAD system's tools to turn on and off different layers of the pattern, inspect the pattern in detail, and use the grading tools to check the grading for the size range.

To document graded patterns in CAD, follow these steps:
1) import your graded patterns,
2) create a new drawing for each pattern,
3) label each drawing with the grade size and garment name,
4) add a title block with the garment name, grade size, date, designer's name, and company name, and
5) save each drawing as a PDF file.

Use a consistent layer structure for all graded patterns, use annotation tools to add notes and instructions, use measurement tools to add measurements, and use grading tools to generate a grading table for each pattern. Save the graded patterns in a central location for easy access.

Examples of documenting graded patterns include labeling a drawing, adding a title block, and saving as a PDF file. To label a drawing, use the text tool, align the text, and edit the title block information. To save a PDF file, open the drawing, select "Save As", choose the "PDF (*.pdf)" file format, and click "Save" to save the file.

SELF CHECK - FIVE

PART ONE: TRUE/FALSE QUESTIONS

1) There are many different grading systems used in CAD software programs.
2) The base size is the size of the pattern without any ease or seam allowance.
3) The number of sizes in grading is determined by the required size range and the desired grade increments.
4) Grade increments are the amount by which the pattern is increased or decreased for each size.
5) Stacking grade points or lines are used to align pattern pieces when grading.
6) When grading patterns on a computer, it is important to use patternmaking technical skills to ensure that the integrity of the pattern is preserved.
7) All pattern pieces should be labeled with pattern marking symbols to indicate seam allowances, notches, and other important details.
8) It is important to check and rectify graded patterns before using them to sew a garment.
9) Graded patterns should be documented to keep track of the grading process and to make it easier to share the patterns with others.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. Which of the following is a common grading system used in CAD?

(A) Proportional grading system (C) Both A and B

(B) Block grading system (D) Neither A nor B

2. What is the base size?

(A) The size of the pattern without any ease or seam allowance

(B) The size of the pattern with ease and seam allowance

(C) The size of the pattern with ease but without seam allowance

(D) The size of the pattern without ease but with seam allowance

3. How is the number of sizes in grading determined?

(A) By the required size range and the desired grade increments

(B) By the base size and the desired grade increments

(C) By the required size range and the base size

(D) By the desired grade increments and the base size

4. What are grade increments?

(A) The amount by which the pattern is increased or decreased for each size

(B) The amount by which the base size is increased or decreased for each size

(C) The amount by which the ease is increased or decreased for each size

(D) The amount by which the seam allowance is increased or decreased for each size

5. What is the purpose of stacking grade points or lines?

(A) To align pattern pieces when grading

(B) To ensure that the pattern pieces fit together properly when sewn

(C) Both A and B

(D) Neither A nor B

6. What is important to keep in mind when grading patterns on a computer?

(A) To use patternmaking technical skills to ensure that the integrity of the pattern is preserved

(B) To understand how to grade different types of pattern features, such as darts, seams, and hems

(C) Both A and B

(D) Neither A nor B

7. Why is it important to label all pattern pieces with pattern marking symbols?

(A) To indicate seam allowances

(B) To indicate notches

(C) To indicate other important details

(D) All of the above

8. What is the purpose of checking and rectifying graded patterns before using them to sew a garment?

(A) To check for errors

(B) To make any necessary corrections

(C) Both A and B

(D) Neither A nor B

9. Why is it important to document graded patterns?

(A) To keep track of the grading process

(B) To make it easier to share the patterns with others

(C) Both A and B

(D) Neither A nor B

PART THREE: SHORT ANSWER QUESTIONS

1. Explain the concept of pattern grading in the context of CAD system pattern production and its significance in achieving size variations for different body types.
2. How does using a CAD system for pattern grading offer advantages over traditional manual grading methods in terms of accuracy, efficiency, and scalability?
3. Describe the key steps involved in grading a pattern using a CAD system, from defining grading rules to generating the graded sizes.
4. Discuss the role of digital grading tools and features in a CAD system and how they enable designers to efficiently grade patterns while maintaining design integrity.
5. How does the visualization capability of a CAD system assist in evaluating and ensuring the accuracy of graded patterns before finalizing them for production?
6. Explain the importance of considering fit and proportion adjustments during the grading process in a CAD system to ensure that the graded sizes maintain the intended design and fit.
7. Discuss the collaboration and communication aspects between designers, pattern makers, and production teams during the pattern grading process in a CAD system.
8. How does a CAD system facilitate the creation and management of size charts, ensuring consistency and accuracy in the graded patterns across different sizes?
9. Share insights on how a CAD system helps in generating pattern grading reports, documentation, and markers for efficient production planning and execution.
10. Discuss any challenges or considerations that designers may encounter when grading patterns in a CAD system, and strategies to address them effectively.

Unit Six: Produce marker

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Check pattern pieces by computer.
- Marker requirements.
- Manipulate and Positioning Pattern pieces in automatic software system.
- Create marker with required pattern pieces, size and fabric requirements.
- Check marker against order requirements.
- Document marker and maintaining records.

This unit will also assist you to attain the learning outcomes stated in the cover page.
Specifically, upon completion of this learning guide, you will be able to:

- Collect and Check requires pattern pieces by computer.
- Identify marker requirements.
- Manipulate and Position Pattern pieces in automatic software system.
- Check Pattern 'grain' indication against grain of material.
- Create marker with required pattern pieces, size and fabric requirements.
- Check marker against order requirements.
- Document marker and maintain records.

6.1 Checking Pattern Pieces by Computer

A CAD (Computer Aided Design) marker is a tool used in the garment industry to automatically generate a cutting layout for pattern pieces. This process optimizes fabric usage and reduces waste. The user imports pattern pieces into the CAD system, specifies fabric width, seam allowances, and desired marker layout. The system generates a marker that efficiently places pattern pieces on fabric. The marker is then previewed and exported to a printer or cutting machine. Benefits of using CAD include increased fabric efficiency, improved accuracy, and increased productivity. CAD markers are generated using computer software, eliminating human error risks. Examples of CAD software for producing markers include Grafis OptiNest, Laser Diamino, and Gerber Accumark. These software packages offer features like automatic marker generation, manual marker editing, fabric defect avoidance, piece matching, grading, reporting, and more.

To collect and check required pattern pieces by computer, follow these steps:

1) Identify the pattern pieces needed, either through a pattern drawing, garment construction guide, or a sewing blog;
2) Import the pattern pieces into a CAD system, which can import them from various file formats like PDF, AI, and EPS;
3) Check the pattern pieces for errors, such as overlapping or intersecting pieces, missing or duplicate pieces, incorrect seam allowances, incorrect grading, and incorrect pattern marking symbols;
4) Use the CAD system's tools to correct any errors found; and
5) Save the corrected pattern pieces in a central location for easy access.

Additional tips for collecting and checking required pattern pieces by computer include using a consistent naming convention, using the CAD system's layer visibility, using zoom and selection tools, grading tools, and pattern marking symbol tools. It is essential to check the pattern pieces for errors before sewing the garment.

Examples of how to collect and check required pattern pieces by computer include importing a pattern piece into a CAD system, checking for errors, correcting errors, and saving the corrected pattern pieces.

6.2. Marker Requirements

To identify marker requirements by CAD, follow these steps:

1) Identify pattern pieces to mark,
2) Import the pattern pieces into a CAD system,
3) specify fabric width and seam allowances,
4) select the desired marker layout,
5) use the CAD system's tools to generate a marker,
6) review the marker to ensure it meets your requirements,
7) make necessary adjustments, and
8) export the marker to a printer or cutting machine.

Additional tips for identifying marker requirements by CAD include using a consistent naming convention, using layer visibility to turn on and off different layers of the pattern pieces, using zoom and selection tools to inspect the pattern pieces in detail, using grading tools to check the grading of the pattern pieces, and using the pattern marking symbol tool to check the pattern marking symbols.

Examples of how to identify marker requirements by CAD include specifying fabric width and seam allowances, specifying the desired marker layout, generating a marker, reviewing a marker, exporting a marker, and checking the pattern pieces for errors and accuracy before cutting the fabric. To use CAD, open the system, click on the "Marker" menu, select "Settings," enter the fabric width and seam allowances, click "OK," and select "Preview."

6.3. Manipulate and Positioning Pattern Pieces in Automatic Software System

Automatic software systems are versatile tools that can be used to manipulate and position pattern pieces in various ways. These include moving and resizing, mirroring and copying, grading, and nesting. These operations are useful for adjusting garment fit, creating new patterns, ensuring symmetrical garments, and creating multiple copies of a pattern piece for different sizes. Grading is a complex process that involves adjusting the pattern pieces to maintain the

same proportions in different sizes. Nesting is another method that minimizes fabric waste and maximizes the efficiency of the cutting process.

To manipulate and position pattern pieces, users can select the pattern piece, click and drag it to the desired location, resize it, mirror it, copy it, grade it, and nest it. The software system will then arrange the pattern pieces on a fabric layout in the most efficient way possible.

Automatic software systems can be a valuable tool for pattern manipulation, saving time and effort while creating more accurate and efficient patterns. Benefits include increased accuracy, increased efficiency, and reduced waste. Automatic software systems can make precise adjustments to pattern pieces, grade patterns for different sizes, and nest them efficiently. By using these tools, users can save time, effort, and create more accurate and efficient patterns.

6.4. Creating Marker with Required Pattern Pieces, Size and Fabric Requirements

To check pattern grain indication against material grain in CAD, import the pattern, identify the grain direction using a single or double arrow, compare the pattern to the material's grain direction, and ensure alignment. Most CAD systems have tools that overlay a grid on the pattern and material, aligning the grid lines with the material's grain direction.

Examples of how to use CAD tools to check pattern grain indication against material grain include Grafis OptiNest's Grain Checker tool, Lectra Diamino's Grain Map tool, and Gerber Accumark's Grain Direction tool.

In Grafis OptiNest, the Grain Checker tool overlays a grid on the pattern and material, aligning the grid lines with the material's grain direction. In Lectra Diamino, the Grain Map tool overlays a grid on the pattern and material, aligning the grid lines with the material's grain direction. In Gerber Accumark, the Grain Direction tool aligns the grid lines with the material's grain direction.

In summary, CAD tools like Grafis OptiNest, Lectra Diamino, and Gerber Accumark can help in checking pattern grain indication against material grain direction.

To create a marker with required pattern pieces, size, and fabric requirements in CAD, follow these steps:

1. Open the CAD system and import the required pattern pieces.
2. Select the required pattern pieces and place them on the fabric layout.
3. Ensure the pattern pieces are placed in the correct orientation and seam allowances.
4. Use the CAD system's tools to nest the pattern pieces on the fabric layout to minimize fabric waste and maximize the cutting process efficiency.
5. Generate the marker, preview it, and export it to a printer or cutting machine.

Additional tips for creating a marker with required pattern pieces, size, and fabric requirements include using a consistent naming convention, using the CAD system's layer visibility, using zoom and selection tools, grading tools, pattern marking symbol tool, and checking the pattern pieces for errors and marker accuracy before cutting the fabric.

Examples of creating a marker with required pattern pieces, size, and fabric requirements in CAD include Grafis OptiNest, Lectra Diamino, Gerber Accumark, and Lectra Diamino.

In summary, creating a marker with required pattern pieces, size, and fabric requirements in CAD requires a consistent naming convention, layer visibility, zoom and selection tools, grading tools, pattern marking symbol tool, and accuracy checks.

6.5. Check Marker Against Order Requirements

To check a marker against order requirements in CAD, follow these steps:

1. Open the marker in the CAD system.
2. Identify the order requirements, such as garment style, garment size, quantity, and fabric type.
3. Inspect the marker to ensure it meets all order requirements, including all required pattern pieces, correct orientation, seam allowances, fabric width, and quantity of pattern pieces.
4. If the marker does not meet all order requirements, make necessary adjustments.
5. Save and export the marker to a printer or cutting machine.

Additional tips for checking a marker against order requirements in CAD include using the CAD system's layer visibility to identify and fix errors more easily. Use zoom and selection tools to inspect the marker in detail. Use measurement tools to check fabric width and quantity of pattern pieces.

Examples of checking a marker against order requirements in CAD include Grafis OptiNest, Lectra Diamino, and Gerber Accumark.

In Grafis OptiNest, the order requirements are entered, and the marker is checked against them. If the marker does not meet all requirements, an error message is displayed. Adjustments are made, and the marker is saved and exported to a printer or cutting machine.

In summary, checking a marker against order requirements in CAD is crucial for accurate and efficient fabric cutting.

6.6. Document Marker and Maintaining Records

In CAD (Computer-Aided Design) systems used in pattern production, document markers and record-keeping are essential for maintaining accurate and organized information throughout the production process. Here's how document markers and record maintenance are typically handled:

- **Document Markers:**

1. Pattern ID: Each pattern in the CAD system is assigned a unique identification number or code. This helps in tracking and referencing patterns during production.
2. Pattern Name/Description: Patterns are labeled with names or descriptions to provide additional context or information about the specific garment style or design.
3. Revision Control: Patterns may undergo revisions or updates during the production process. Document markers help track the version or revision number of each pattern, ensuring that the latest version is used.
4. Annotation and Marking Tools: CAD systems offer annotation and marking tools that allow pattern makers to add comments, measurements, notations, or specific instructions directly on the pattern. These annotations serve as markers within the document, providing additional information to the production team.

Record Maintenance:

1. **Pattern Library:** CAD systems typically include a pattern library or database where all the pattern files and associated information are stored. This centralized location ensures easy access and retrieval of patterns as needed.
2. **Version History:** The CAD system maintains a history of pattern revisions, including details of changes made and who made them. This version history helps track the evolution

SELF CHECK - SIX

PART ONE: TRUE/FALSE QUESTIONS

1. Marker production in a CAD system allows for efficient material utilization by optimizing the layout of pattern pieces on the fabric.
2. Marker production in a CAD system eliminates the need for manual marker planning and increases the speed of pattern production.
3. Marker production in a CAD system provides accurate calculations for fabric consumption, allowing designers to estimate material costs more effectively.
4. Marker production in a CAD system allows for automatic nesting of pattern pieces, reducing fabric waste and improving production efficiency.
5. Marker production in a CAD system enables designers to visualize the placement and orientation of pattern pieces on the fabric before actual cutting.
6. Marker production in a CAD system does not require any input or consideration of the fabric width or pattern piece sizes.
7. Marker production in a CAD system allows for easy customization and manipulation of marker layouts based on specific production requirements.
8. Marker production in a CAD system does not provide any benefits in terms of reducing production errors or improving cutting accuracy.
9. Marker production in a CAD system can generate reports and documentation related to fabric utilization, marker efficiency, and cutting instructions.
10. Marker production in a CAD system is a manual process that requires the designer to manually position and arrange pattern pieces on the fabric layout.

PART TWO: MULTIPLE CHOICE QUESTIONS

1.In marker production using a CAD system, what does optimization refer to?

a) Creating a visual representation of the fabric layout

b) Calculating the fabric consumption and costs accurately

c) Maximizing material utilization by arranging pattern pieces efficiently

d) Generating reports and documentation related to marker efficiency

2.What is the benefit of automatic nesting in marker production?

a) Reducing fabric waste and improving production efficiency

b) Enabling visualization of pattern pieces on the fabric

c) Customizing marker layouts based on production requirements

d) Estimating material costs effectively

3. What role does a CAD system play in marker production?

a) Providing an interface for manual marker planning

b) Generating physical markers for pattern production

c) Automating the placement of pattern pieces on the fabric

d) Calculating body measurements for pattern development

4. What information is typically considered during marker production in a CAD system?

a) Fabric width and pattern piece sizes

b) Thread colors and stitch types

c) Garment style and design elements

d) Fabric texture and weight

5.What is the purpose of visualizing the marker layout before cutting in a CAD system?

a) Identifying pattern grading issues

b) Estimating the production timeline

c) Ensuring accurate fabric positioning

d) Evaluating the garment fit

PART THREE: SHORT ANSWER QUESTIONS

1. How does marker production in a CAD system contribute to efficient material utilization in the garment manufacturing process?
2. Describe the key advantages of using a CAD system for marker production in terms of speed and accuracy compared to manual marker planning.

3. How does automatic nesting of pattern pieces in a CAD system help in reducing fabric waste and improving production efficiency?
4. Explain the role of a CAD system in visualizing the marker layout before cutting and its impact on ensuring accurate fabric positioning.
5. Discuss the importance of considering fabric width and pattern piece sizes during marker production in a CAD system and how it affects material consumption and costs.
6. How does a CAD system facilitate customization and manipulation of marker layouts to meet specific production requirements? Provide examples.
7. Describe the potential benefits of generating reports and documentation related to marker efficiency, fabric utilization, and cutting instructions using a CAD system.
8. Explain the level of automation involved in marker production in a CAD system and how it streamlines the pattern production process.
9. Discuss the role of collaboration and communication between designers, pattern makers, and production teams in marker production using a CAD system.
10. Share insights on the challenges or limitations of marker production in a CAD system and potential strategies to overcome them for optimal results.

Unit Seven: Complete work

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Complete design of Pattern pieces.
- Plot requires information.
- Plot finished markers.
- Fill and documenting completed patterns and marker.

This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Complete Pattern pieces and marker in according to design.
- Establish plotting requirements in according to required information.
- Plot finished markers.
- Fill and document completed patterns and marker.

7.1 Complete Design of Pattern Pieces

Completing work in a CAD system means finishing a task or project using computer-aided design software. This can involve a wide range of activities, such as:

- Creating new designs
- Modifying existing designs
- Generating technical drawings
- Creating photorealistic renderings
- Simulating real-world conditions
- Fabricating products

CAD systems are used in a variety of industries, including engineering, architecture, manufacturing, and design. They can be used to create everything from simple 2D drawings to complex 3D models.

To complete work in a CAD system, users typically follow these steps:

1. Import the necessary files, such as sketches, 3D models, or other CAD data.
2. Use the CAD system's tools to create or modify the design.
3. Review the design to make sure that it is accurate and meets all requirements.
4. Save the design and export it to the desired file format.
5. The specific steps involved in completing work in a CAD system will vary depending on the type of project, the CAD software being used, and the user's experience level. However, the general principles are the same.

Here are some examples of how CAD systems are used to complete work in different industries:

- Engineering: CAD systems are used to design and engineer everything from bridges and buildings to cars and airplanes. Engineers use CAD software to create detailed drawings and models that can be used to simulate real-world conditions and test different design scenarios.
- Architecture: CAD systems are used to design buildings and other structures. Architects use CAD software to create 3D models of their designs, which can then be used to generate floor plans, renderings, and other construction documents.
- Manufacturing: CAD systems are used to design and manufacture products. Manufacturers use CAD software to create 2D drawings and 3D models of their products, which can then be used to generate machine tool code for CNC machines.

- Design: CAD systems are used to design a wide range of products, including furniture, clothing, and consumer goods. Designers use CAD software to create 3D models of their designs, which can then be used to generate prototypes and marketing materials.

Overall, CAD systems are essential tools for completing work in a variety of industries. By using CAD software, users can create accurate and efficient designs that can be used to improve the quality and productivity of their work.

To complete pattern pieces and marker according to design in CAD, you can follow these steps:

1. Import the design into the CAD system. This can be done by scanning a hand-drawn design or by importing a digital file, such as a PDF or AI file.
2. Create or modify the pattern pieces. Use the CAD system's drawing tools to trace the pattern pieces from the design or to create new pattern pieces from scratch.
3. Grade the pattern pieces. Use the CAD system's grading tools to grade the pattern pieces for different sizes.
4. Nest the pattern pieces on a fabric layout. Use the CAD system's nesting tools to arrange the pattern pieces in the most efficient way possible.
5. Complete the marker. Add seam allowances, notches, and other markings to the pattern pieces.
6. Save and export the marker. Save the marker in a file format that can be used by your cutting machine or plotter.

Here are some additional tips for completing pattern pieces and marker according to design in CAD:

- Use a consistent naming convention for all of your pattern pieces and markers. This will make it easier to find and organize your files later on.
- Use the CAD system's layer visibility to turn on and off different layers of your pattern pieces and markers. This can help you to identify and fix errors more easily.
- Use the CAD system's zoom and selection tools to inspect your pattern pieces and markers in detail.
- Use the CAD system's measurement tools to check the dimensions of your pattern pieces and markers.
- Make sure to back up your files regularly.

Here are some specific examples of how to complete pattern pieces and marker according to design in CAD:

- To create a new pattern piece:

1. Use the CAD system's drawing tools to trace the pattern piece from the design or to draw a new pattern piece from scratch.
2. Add seam allowances and other markings to the pattern piece.
3. Save the pattern piece.

- To grade a pattern piece:

1. Select the pattern piece in the CAD system.
2. Click on the CAD system's grading tool.
3. Enter the grading increments in the CAD system's dialog box.
4. Click on the "OK" button.
5. The CAD system will grade the pattern piece for different sizes.

- To nest pattern pieces on a fabric layout:

1. Select the pattern pieces in the CAD system.
2. Click on the CAD system's nesting tool.
3. The CAD system will arrange the pattern pieces on a fabric layout in the most efficient way possible.

- To complete the marker:

1. Review the marker to make sure that all of the pattern pieces are included, that they are placed in the correct orientation, and that the seam allowances are correct.
2. Add any additional markings to the marker, such as notch placement and grain direction.
3. Save the marker.

7.2. Plot Requires Information

When establishing plotting requirements in CAD pattern making, you need to consider the specific information that needs to be conveyed through the plotted patterns. Here are some key considerations:

a. **Pattern Outlines:** Ensure that the plotted patterns clearly show the outline or shape of each pattern piece. This includes accurately representing curves, corners, and straight lines.

b. **Grainlines:** Plotting should include the grainlines of the pattern pieces. Grainlines indicate the direction of the fabric's grain and help ensure proper fabric alignment during cutting and sewing.

c. **Notches:** Notches are small markings on pattern edges that help align pattern pieces during assembly. Make sure that the notches are plotted clearly and accurately to facilitate precise garment construction.

d. **Seam Allowances:** Indicate the seam allowances on the plotted patterns. Seam allowances define the distance between the pattern edge and the stitching line and are necessary for proper seam construction.

e. **Pattern Labels:** Include pattern labels or identifiers on the plotted patterns. These labels can indicate the pattern name, pattern number, size, or any other relevant information for easy identification.

f. **Measurement Markings:** Plotting should include measurement markings such as length, width, and key reference points. These markings assist in pattern manipulation, size grading, and garment construction.

g. **Pattern Repeats:** If the pattern requires repeating motifs or prints, ensure that the plotting reflects the intended repeat accurately. This is especially important for patterns used in fabric printing or textile design.

h. **Cutting Instructions:** If specific cutting instructions are necessary, include them in the plotting. These instructions may involve marking specific areas for not cutting, indicating fold lines, or specifying pattern placement on the fabric.

i. **Annotations and Special Instructions**: Plotting can also include annotations or special instructions that provide additional information or guidance for the pattern maker or cutter. These annotations can be used to highlight specific details or techniques required for the garment.

j. **Plotting Scale**: Determine the appropriate scale for plotting patterns based on the intended use. For example, if the patterns will be used for manual cutting, a 1:1 scale is typically used. If plotting is for reference or documentation purposes, a reduced scale may be acceptable.

It's important to note that the specific plotting requirements may vary depending on the CAD software being used, industry practices, and individual preferences. Ensure that you adhere to any specific guidelines or standards set by your organization or clients to maintain consistency and accuracy in pattern plotting.

7.3. Plot Finished Markers

When it comes to plotting finished markers in CAD pattern making, the process involves generating physical output of the markers for cutting and production purposes. Here are the general steps to plot finished markers using CAD:

a. **Prepare the Marker:** In the CAD software, ensure that the marker is finalized and ready for production. This includes ensuring all pattern pieces are correctly placed, nested efficiently, and aligned according to the desired fabric layout.

b. **Configure Plotting Settings**: Set up the plotting settings in the CAD software. This includes specifying the plotter or printer to be used, selecting the appropriate paper size, and setting the desired plot scale.

c. **Generate Plot Files**: Generate the plot files from the CAD software. These files contain the information needed for the plotter or printer to create the physical output. The plot files can be in formats such as HPGL, DXF, or PDF, depending on the capabilities of the plotting equipment.

d. **Connect Plotter/Printer**: Ensure that the plotter or printer is correctly connected to the computer running the CAD software. This may involve connecting via USB, Ethernet, or other supported interfaces. Install any necessary drivers or software for the plotter if required.

e. **Load Paper:** Load the appropriate paper or media into the plotter or printer. Use paper rolls or sheets that match the size required for the markers. Ensure that the paper is properly aligned and secured to prevent any misalignment during plotting.

f. **Plot the Markers:** Send the plot files from the CAD software to the plotter or printer. The plotter will interpret the files and proceed with plotting the markers onto the loaded paper.

The plotter will follow the instructions in the files to create the outlines, notches, grainlines, and any other specified information on the paper.

g. **Inspect the Output:** Once the plotting is complete, carefully inspect the plotted markers for accuracy and quality. Check that the pattern outlines, notches, and other design elements are clearly represented on the paper. Ensure that the scale and measurements are correct.

h. **Remove the Plotted Markers**: After inspecting the plotted markers, remove them from the plotter or printer. Handle them with care to prevent any damage or distortion.

i. **Follow Cutting Instructions**: Provide the plotted markers to the cutting department or follow the specific cutting instructions associated with the markers. These instructions may include details on fabric placement, cutting techniques, or any special considerations for the production process.

It's worth noting that the specific steps and settings for plotting may vary depending on the CAD software and plotter/printer being used. Follow the manufacturer's instructions and any guidelines provided by your organization to ensure accurate and high-quality plotting of the finished markers.

7.4. Fill and Documenting Completed Patterns and Marker

When completing patterns and markers in CAD pattern making, there are several steps involved in filling and documenting the final designs. Here's a general guide:

Pattern Completion:

- Ensure that all pattern pieces are finalized and accurately drafted in the CAD software.
- Double-check the pattern outlines, notches, grainlines, and any other necessary design elements for accuracy.
- Verify that seam allowances, hem allowances, and any other required specifications are included in the pattern pieces.
- Review and adjust the patterns as needed to meet any specific style or fit requirements.

Marker Layout:

- Create a marker layout using the finalized patterns. Arrange the pattern pieces efficiently on the marker to maximize fabric utilization and minimize wastage.
- Consider factors such as fabric width, pattern repeat, and cutting instructions while arranging the pattern pieces.
- Optimize the marker layout to achieve the desired production goals, such as minimizing material costs or maximizing cutting efficiency.

Fill Patterns:

- Fill the pattern pieces with appropriate colors or shading in the CAD software to differentiate between pattern elements, such as the main body, seam allowances, notches, and other relevant details.
- Use consistent and standardized colors or shading conventions to aid in quick and clear pattern interpretation.

Documenting Completed Patterns and Marker:

- Create a digital documentation file that includes the completed patterns and marker layout. This can be a single file or a collection of files, depending on the complexity of the design.
- Include essential information in the documentation, such as pattern names, style numbers, sizes, date of completion, and any specific notes or instructions relevant to the patterns and marker.
- Add measurement charts, if applicable, indicating key body measurements associated with each size.
- Include any additional technical drawings, construction details, or assembly instructions that are relevant to the patterns and marker.
- Organize the documentation in a clear and structured manner to facilitate easy access and understanding.

Save and Store Documentation:

- Save the completed patterns, marker layout, and associated documentation in a secure location or document management system. Choose appropriate file formats that are compatible with the CAD software and easily accessible for future reference.
- Establish a clear naming convention for the files to ensure consistency and easy retrieval.

Review and Approval:

- Review the completed patterns and marker documentation for accuracy, adherence to design specifications, and any required quality checks.
- Seek necessary approvals from relevant stakeholders, such as designers, pattern makers, or production managers, to ensure that the completed patterns and marker meet the desired standards.

By filling and documenting completed patterns and markers in CAD pattern making, you create a comprehensive and accurate record of the design and production information. This documentation serves as a reference for pattern makers, sample makers, and production teams, ensuring consistent and efficient execution of the garment manufacturing process.

SELF CHECK - SEVEN

PART ONE: TRUE/FALSE QUESTIONS

1. Complete Pattern pieces and marker in according to design.
2. Establish plotting requirements in according to required information.
3. Plot finished markers.
4. Fill and document completed patterns and marker IN CAD.

PART TWO: MULTIPLE CHOICE QUESTIONS

1. In the context of CAD system pattern production, what does "completing work" typically refer to?
    a) Finalizing pattern modifications
    b) Generating markers for cutting
    c) Conducting fit evaluations
    d) Printing physical patterns
2. What is the purpose of conducting a fit evaluation in a CAD system?
    a) To determine the appropriate fabric type for the pattern
    b) To assess the accuracy and suitability of the pattern for the intended body shape
    c) To generate reports and documentation for pattern production
    d) To visualize the placement and orientation of pattern pieces on the fabric
3. What role does a CAD system play in generating markers for cutting?
    a) It ensures accurate fabric positioning during cutting
    b) It provides automatic nesting of pattern pieces to minimize fabric waste
    c) It allows for manual arrangement of pattern pieces on the fabric layout
    d) It assists in creating three-dimensional visual representations of garments
4. How does a CAD system facilitate the production of physical patterns?

a) By providing options for digital pattern storage and retrieval

b) By enabling efficient pattern grading and size variations

c) By automatically calculating fabric consumption and costs

d) By allowing for the printing or plotting of pattern pieces onto paper or other materials

5. What is the benefit of using a CAD system for completing work in pattern production?

a) Improved collaboration and communication between designers and pattern makers

b) Enhanced accuracy and efficiency in pattern modifications and adjustments

c) Reduced fabric waste and improved material utilization

d) Increased speed and productivity in the overall pattern production process

PART THREE: SHORT ANSWER QUESTIONS

1. What is the difference between a pattern and a marker in CAD?
2. What are the steps involved in creating a marker in CAD?
3. What are the factors to consider when establishing plotting requirements for markers?
4. How can you fill and document completed patterns and markers in CAD?
5. What are the benefits of using CAD for marker making?

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