

MARKING SCHEME

TEXTILE CHEMICAL PROCESSING (779)

STD XII (2018-19)

Time: 2.5 Hrs.

MM: 50

GENERAL INSTRUCTIONS

- 1. Attempt all questions**
- 2. Illustrate your answers, wherever possible**

1. Define the following term (Do any 10)

(1x10=10)

I. Bleaching

II. Cross dyeing

III. Mudmee Tie-Dye

IV. Soil release

V. Direct prints

Answer:

1. **Bleaching**- Bleaching is a process of removal of natural coloring matter and to make the fabric perfect white with minimum damage to fibers and within the shortest possible time.

2. **Cross dyeing**- Yarn, fabric or even garment made with two or more generic fiber types "Blends" having different dyeing qualities is dyed a single dye bath containing different classes of dyes.

3. **Mudmee Tie-Dye**- Mudmee tie-dye is mainly created in Thailand and neighboring part of Laos. It uses different shapes and colors than other types of tie-dye.

4. **Soil release**- This type of finish Improves the resistance to soil during the day to day use of the fabric and provides easy releasing of soil during the washing operations.

Repelling the soil.

. Preventing formation of bond between soil and fabric.

5. **Direct prints**- This print is also called an application print and it is most popular types of print style. This print design is printed directly onto a white cloth or over a previously dyed pale coloured fabric. In this print, the printed portion is considerably darker than the dyed backgrounds.

Fill in the blanks.

VI. Removal of protruding from both sides of fabric is as **SINGEING**.

VII. Hydrogen peroxide is called **UNIVERSAL BLEACHING AGENT**.

VIII. **DIRECT DYES** derived from formulation of Benzedrine salts.

IX. **DISPERSE DYES** can be used for heat transfer.

X. **SHAPE-RETENTION FINISH** produces-dimensions on fabric.

XI. **SCREEN PRINTING** is an example direct style of printing.

XII. **FELTING** process, wool fabric is warm progressive shrinkage.

Very short answers (Do any 5)

(2x5=10)

2. Describe the resist dyeing method?

Answer: Resist dyeing is a term for a number of traditional methods of dyeing textiles with patterns. Methods are used to 'resist' or prevent the dye from reaching all the cloth, thereby creating a pattern and ground. The most common forms use wax, some type of paste or a mechanical resist that manipulates the cloths such as tying or stitching. The most well-known varieties today include tie-dye and batik.

3. What is the importance of garment dyeing?

Answer: (a) Dyeing of garment according to fashion can be performed i.e. less fashion risk.

(b) Garments of non tailored categories such as sweaters, sweat shirt can be easily dyed.

4. Which terminology is used in Dyeing Process?

Answer: Terminology Used in Dyeing Process.

(A) Material to Liquor Ratio (M: L Ratio)

(B) % Dye bath Exhaustion

(C) % Fixation

5. Name the two categories of printing and their methods?

Answer: Two categories of printing are:

1. Methods of Printing

2. Style of Printing

Various methods of printing are:

- (a) Stencil Printing
- (b) Hand Block Printing
- (c) Hand Screen Printing
- (d) Flat Bed Screen Printing
- (e) Rotary Printing
- (f) Roller Printing
- (g) Digital or Inkjet Printing

6. What are the advantages of stencil printing?

Answer: The advantages of stencil printing are:-

- (i) Wet-on dry prints effect possible.
- (ii) Better penetration of color than roller prints due to heavier lay-on of color.
- (iii) Acceptable to all woven & knitted fabrics.
- (iv) Rapid preparation of screens and rapid pattern changes are possible.
- (v) Ability to print cut garment parts and small items (towels, scarves etc.)

7. What are the styles of prints?

Answer: Styles of prints are:-

- (i) Direct style of prints.
- (ii) Discharge style of prints.
- (iii) Resist style of prints.

8. Name the chemical used in De-sizing?

Answer: De-sizing method requires enzyme, wetting agent and NaCl in the impregnating bath.

Short Answers (Do any 5)

(3x5=15)

9. What are direct prints and its importance?

Answer: Direct prints are also called pigment prints. In this type of prints, pigments are used as colouring matter compared to dyes. After printing with pigments, it does not require washing of the fabric, hence it is also called dry printing.

Importance of direct printing: -

1. Simple to apply.
2. Less amount of processing.
3. No after treatment is required.
4. Can be applied to all fibers.

10. Write down the specific features of the following prints (any one)?

a. Flock prints

b. Duplex prints

Answer: (a) Specific feature of Flock prints: - Velvet like effect are produced on the printed surface. For this purpose, fabrics designs is first printed with adhesive and tiny particles of fibers (1/10" – 1/4") are made to adhere to a fabric surface in accordance with a particular design and then exposing the fiber flock adhere to the fabric at very high temperature.

There are two type of Flock printing:

1. Mechanical Flocking.
2. Electrostatic Flocking.

(b) Duplex prints:-In this style of prints, Fabric is printed on both the sides. This generally provides imitate Jacquard & Dobby woven pattern to the fabrics. It is very expensive printing.

11. Describe the importance of screen prints?

Answer: The importance of screen prints is as below:-

- (a) Adaptable to all woven and knits.
- (b) Rapid change over of designs possible.
- (c) Better color definition.
- (d) Ability to print cut garment parts.

12. Write a short note on following:

- a. Embossed calendaring
- b. Fiction calendaring

Answer: (a) Embossed calendaring:-It produces three-dimensional design on fabric. Embossing calendar consists of heated hollow metallic roller engraved with the embossing design and solid paper roller, twice the size of engraved roller. Fabric is drawn between the two rollers and designs are embossed on the fabric surfaces. If Celluloses fabrics are used for embossing purpose then effect will be temporary finish, however, Celluloses pre treated with resin will provide Semi durable embossing effect. Permanent embossing can be achieved on the Synthetic fabrics.

(b) Fiction calendaring: -This type of calendaring gives highly polished surface like Glazed Chintz Cotton fabric. If a very high gloss is required, then fabric is pre-impregnated with a wax emulsion and calendaring is carried out. If the fabric is pre-treated with resin then this is a semi-durable type of finish.

13. Distinguish between Water repellent and water proof finish.

Answer:

Water repellent finish	Water proof finish
a. This is not a permanent type of finish.	This is a permanent type of finish.
b. Water repellent fabric resist wetting but air/moisture can penetrate.	This is completely moisture proof fabrics which provide protection under all conditions of wet weather.
c. In water repellent fabrics gaps between yarns are filled up with chemicals.	Fabric is coated or laminated with a film of natural or synthetic rubber.

14. Difference between Acid wash and Stone wash?

Answer:

Acid wash	Stone wash
a. In this process bleaching agent is added during washing.	In this process fabric or garment is tumbled with abrasive material for 30-60 minutes.
b. Colour of denim fabric destroyed and white background appeas.	Style and type of stone wash affects the time of abrasion required.

15. How do you identify Direct print on the given fabric?

Answer: Direct prints can be identified on the given fabric by the background. The background is generally white or has larger portions of white background. The printed design is lighter in shade on back of the fabric than on the face.

Section B

Long Answers (Do any 3)

(5x3=15)

16. Give important features of stock dyeing?

Answer: Stock dyeing is this process of dyeing in which loose fibers are dyed by circulating the dye liquor continuously through fibers.

Important Features of Stock Dyeing:

1. Expensive method of dyeing.
2. Production is less.
3. 10-15% waste of dyed fibers during dyeing.
4. Excellent penetration of dye in to fiber.
5. Fashion risk - It means that final color of the fabric has to be decided in earliest stage in its manufacture.

17. Write a short note on the following:

- a. Soil release finish
- b. Preparation of wool for dyeing and printing
- c. Winch dyeing machine

Answer. (a) Soil release finish: -This type of finish Improves the resistance to soil during the day to day use of the fabric and provides easy releasing of soil during the washing operations and prevent the soil to redeposit on the fabric and retaining whiteness or the original colour of fabric. The Soil Release Finish reduces the degree of soiling of the fabrics by:

1. Repelling the soil.
2. Preventing formation of bond between soil and fabric.

(c) Winch dyeing machine:-It is a conventional type of dyeing machine consisting of a tub containing the dye liquor and an elliptical winch or reel which is located horizontally above the dye bath. In this machine both the ends of fabric are stitched together to make continuous rope form and is passed through the dye bath. The fabric is submerged in the dye bath and circulated repeatedly. Fabric is held in a slack in loose condition during dyeing.

Important Features of Winch Dyeing:-

- a. Mainly used for knits and lightweight fabrics.
- b. Filament yarn fabrics should not be dyed.
- c. Very light weight fabrics should also be avoided.
- d. Dyeing is carried out at high liquor ratios. (1:20 to 1:50).

18. Write the important features of the following dyes

a. Vat Dyes

b. Disperse Dyes

c. Sulfur Dyes

Answer: a. Vat Dyes: -Vat dyes are insoluble organic compounds and do not have any substantivity to cellulose. These dyes are widely used for cellulose fibers and can also be used for protein and nylon fibers. They produce good color range but limited selection of orange, blue. Bright green are more popular in this class. Large amount of dyes are required to attain deeper shade.

b. Disperse Dyes: -These dyes are largely used for dyeing of polyester material. Disperse dyes are Non-ionic aromatic compounds with relatively low molecular weight and have an extremely low solubility in water. These dyes are available in the form of powders, granules, liquid or paste form. These dyes can be sublimize at higher temperature and this sublimation property of Disperse dyes at high temperature is used in the transfer printing and rapid dyeing process. Dyeing of polyester is generally carried out at high temperature and high pressure. These dyes are also used for heat transfer printing. Disperse dyes produces very good range of shades except dark blue and black. These dyes are having good -excellent fastness to perspiration, crocking and dry cleaning and Fair-Good fastness to light and washing. When these dyes are used on acetate, it exhibits poor fastness to light and subject to gas fading.

c. Sulfur Dyes:-Sulfur dyes are widely used for cellulosic fibers for darker shades. Sulfur dyes are relatively easy to dye cellulosic fiber with good-to-excellent washes and lights fastness at a low cost. It produces a complete range of colors in "dull shade" and gives poor light fastness in pastel shades. These dyes are mainly used for dyeing black, brown, navy blue or olive, in medium to dark shades. Some yellows and blues shades are also available but there is only one red and a green dye. These dyes are also used for improving the wash fastness of the Direct dyed fabric called topping. Sulfur dyes are having good fastness to light, washing, dry cleaning and perspiration. These dyes have poor fastness to chlorine bleach. Sulfur dyed materials cannot be stored for longer periods.

19. Write the function of jet Dyeing machine?

Answer: Jet dyeing machines are a very efficient in term of contact between the dye liquor and fabric. In this machine both fabric and dye liquor are in continuous movement. This improves level of dyeing in shorter dyeing time. Fabric is circulated through the dye bath in rope form. The movement of the fabric

occurs by circulating the dye-liquor through a venturi jet. Jet dyeing machines are pressurized and dyeing can take place at high temperature 135-150°C. Jets are builds to be used at low liquor ratios between 10:1 and 5:1 and lower.

Advantages of Jet Dyeing Machines:

1. Less consumption of water, energy and chemicals.
2. Shorter dyeing cycle time.
3. Efficient and high production rate.
4. Delicate woven / Knits, textured and lightweight fabrics can be dyed.

20. What are the main objectives of mercerizing process?

Answer: In the Mercerization process, cotton fabric or yarn is treated with a cold concentrated solution of sodium hydroxide for one minute or less. In this process cotton fibers swell, untwist and their bean shaped cross section changes into a round form.

Mercerization improves the following properties of the cotton fabric.

1. Strength would be increased to 15-25%.
2. Enhanced luster. Greater affinity to water.
3. Dyes and other chemical finishes.
4. Shrinkage control in both the direction of the fabric.

Fabric is padded with about 20-25% NaOH solution containing a wetting agent. Fabric is passed over several cans to allow a dwelling time of approximately one minute. During this time, NaOH will penetrate the fibres and react with them. At this stage the tension is applied lengthwise. The fabric is then placed on a "Stenter" machine and is pulled to its desired dimensions.