L22-Introduction to Fabric Science

Keywords

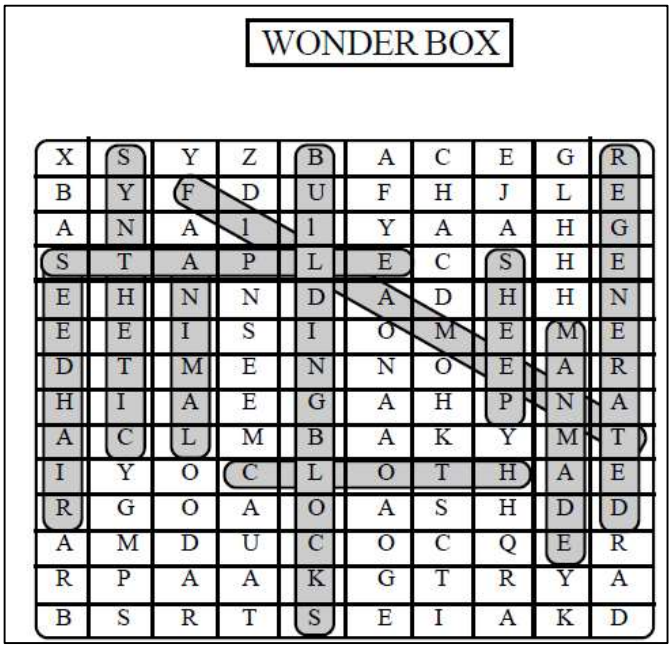
Decorating	Nylon and polyester	Staple	Polyester	Residue
Casual attire	Cotton	Filament	Acrylic (cashmilion)	Burn test
Office wear	Silk	Minerals	Nylon	Mineral fibre
Night suit	Wool	Cellulose	Rayon	Vegetable fibre
Odour	Fibre	Asbestos	Regenerated fibre	Synthetic fibre

In-text Questions

In-text Questions 22.1

1. The missing words in the following sentences are hidden in the wonder box. The words are written downwards, across and sideways. Find and encircle these words and complete the sentence.

WONDER BOX



a. A fabric is any piece of cloth.
b. Short fibres are called staple and long fibres are called Filament.
c. Fibres are the building blocks of a fabric.
d. Fibres can be classified into natural and man-made.
e. Manmade fibres can be regenerated or synthetic.
f. Wool is an animal fibre obtained from sheep.
g. Polyester is a synthetic fibre.
h. Cotton comes from the seed hair of a plant.

2. Match column A with column B

A	B
a. Rayon	i. Synthetic fibre
b. Cotton	ii. Stem fibre
c. Silk	iii. Regenerated fibre

d.	Nylon	iv.	Natural cellulosic fibre
e.	Wool	v.	Leaf fibre
f.	Jute	vi.	Animal fibre
g.	Asbestos	vii.	Animal secretion
		viii.	Mineral fibre

a – iii g - viii

b – iv

c – vii

d – i

e – vi

f – ii

In-text Questions 22.2

1. Choose the correct answer. Give reasons for your choice.

   i. Which of the fabrics is most suitable for winters?

   a. Cotton
   b. Nylon
   c. Wool✓
   d. Polyester

   Reason : Wool is bad conductor of heat. Hence, it keeps body heat around the body only and keeps us warm.

   ii. Which is the strongest fibre?

a. Silk
b. Nylon✓
c. Acrylic
d. Polyester

Reason :The chemical with which Nylon fabric is made helps it to remain strong even after rubbing and wetness. Hence, it is used to make ropes and tyre chords etc.

iii. Which fabric will require least ironing after washing?

a. Cotton
b. Rayon
c. Silk
d. Polyester✓

Reason : Polyster fabric has excellent recovery from wrinkiling and creasing even after washing.

iv. When cotton burns the odour is that of

a. Burning paper✓
b. Burning hair
c. Acid
d. Chemical

Reason: Cellulosic fibres when burnt give the odour of burnt paper. As, Cotton fabric is cellulose based, it gives burning paper smell when burnt.

v. Synthetics, when brought near the flame will

a. Curl away

b. Melt and shrink✓

c. Catch fire but not melt

d. Remain unaffected

Reason: This happens due to the chemical properties of substances from which synthetic fibres are made.

vi. Residue of burnt rayon is

a. Hard bead-like, not crushable

b. Crushable bead-like

c. Light grey, feathery

d. Fluffy, small amount✓

Reason: This happens because of the chemical properties of the cellulose and chemicals used in making Rayon fabric.

2. Give Reasons

i. Cotton is suitable for summer wear and undergarments.

Reason: It is cool and absorbant.

ii. Nylon is used for making ropes

Reason: It is the strongest fibre.

iii. Nylon garments are uncomfortable in summers.

Reason: Nylon does not absorb moisture.

Terminal Questions

1. Define a fabric and elaborate on its various uses.

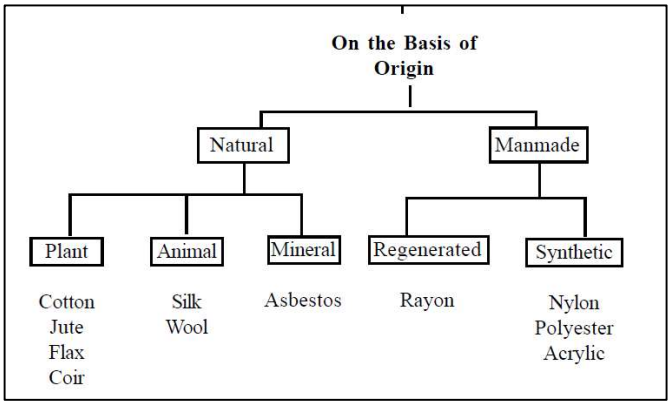
Answer: A fabric is any piece of cloth.

The various uses of fabric are:

- To make clothes to wear.
- To make things for house-hold use like - curtains, bed-sheets, blankets, pillow covers, napkins, towels, carpets etc.
- Other uses are in industry, medical field, automobiles etc.

2. Classify fibers on the basis of their origin.

Answer: On the basis of their origin, fibres are classified as follows:



3. Name the fabric which is suitable for summer wear and state its important properties.

Answer: Cotton is the fabric which is suitable for summer wear. Its important properties are:

- Cotton is made up of staple fibres.
- It is a dull fibre, so it gets dirty quickly.
- As it can absorb moisture easily, it is suitable to make towels, napkins, undergarments and summer clothing.
- As it is a good conductor of heat, it takes away the heat of the body quickly and keeps the body cool during summers.
- It is strong when it is wet.

- Wrinkles and creases easily after and before wash also. Hence, needs starching and ironing.

4. How will you identify a rayon fibre?

   Answer: The Rayon fibre can be identified in two ways:

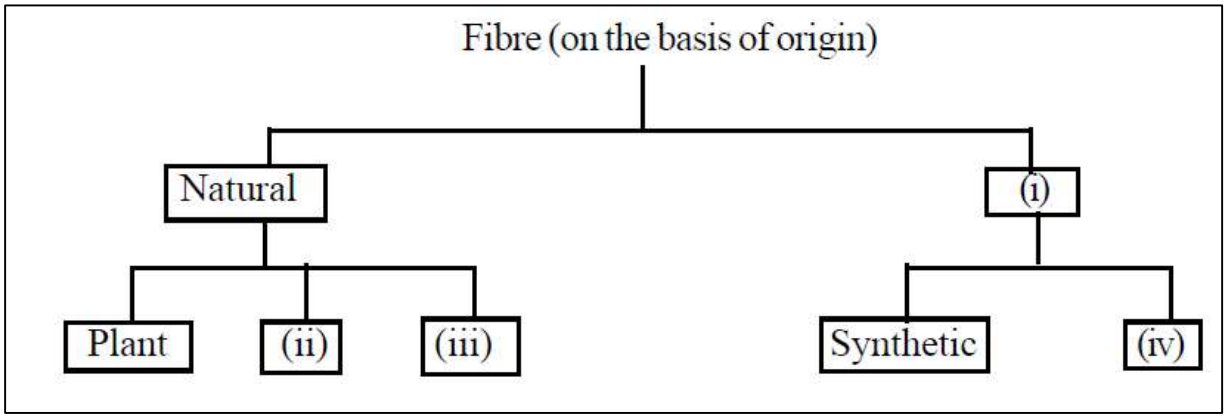
Test	Description
Appearnce	• In appearance, it is smooth and shiny. • Absorbs moisture quickly.
Burn test	• Catches fire when comes into contact with fire. • Burns quickly. • When removed from flame, it continues burning and shows an afterglow. • Gives out burning paper odor. • Residue after burning is light, feathery, and gray in color.

5. Distinguish between natural and manmade fibers.

Answer: The difference between natural and man-made fibres:

Natural Fibres	Man-made fibres
Comes from nature, for example, cotton, silk, wool, jute etc.	Man made fibres, for example, polyster, rayon, nylon etc
Natural color	Color as per requirement is added in color bath
Good absorbents of heat, moisture etc	As they do not have pores, they are not good absorbents.
Chances of containing dust or impurities	No chance of any dust or impurities
Less durable than synthetic	More durable than natural
Comfortable to use	Not as comfortable as natural fibres
Fibre structure cannot be changed.	Fibre structure can be easily changed by man.

6. Complete the following flow chart:-



ii – Animal

iii – Mineral

i – Man-made

iv – Regenerated.

Previous Year Questions

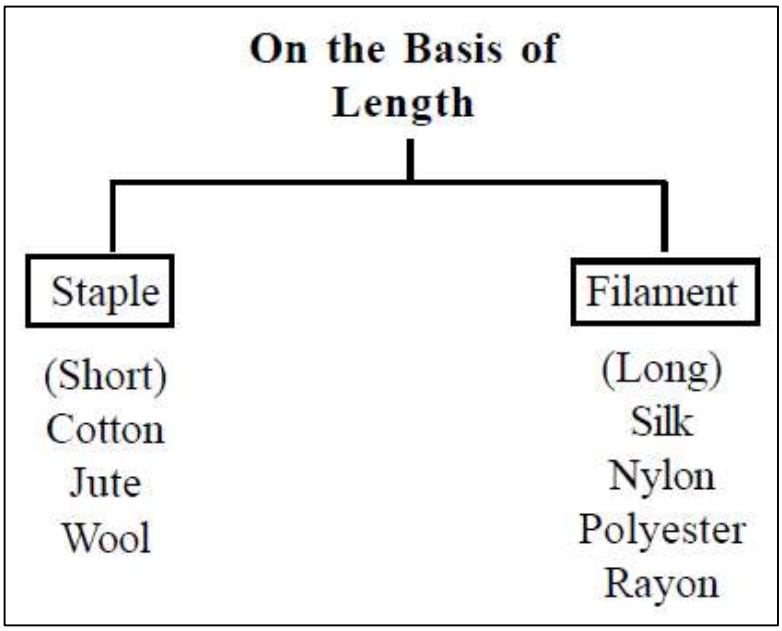
1. Name an animal fibre. Mention its one property which makes it suitable to be worn in winters. [1]

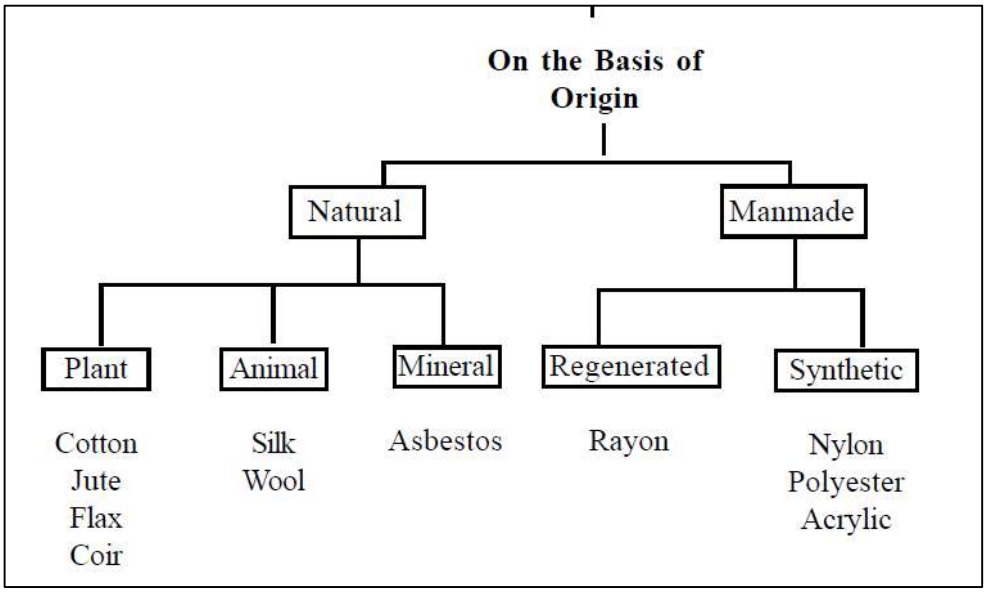
   Answer: Wool is an animal fibre.

   It is bad conductor of heat. Hence, it keeps the body heat around the body only and does not let it go away into the atmosphere. This property of wool keeps us warm in cold weather.

2. Classify the fibres on the basis of length and origin. 2

   Answer: Classification of fibre on the basis of length:





3. The plant fibres are made up of what substance? Name one fibre each obtained from stem of a plant and outer covering of a fruit. 2

   Answer: All the plant fibres are made up of cellulose.

   - Stem of the plant– Jute, Linen
   - Outer covering of a fruit - Coconut husk (Coir)

4. In what *two* ways each burning test can help you identify cotton and wool fibres? 2

   Answer: Burning test will yeild the following:

Cotton	Wool
1. Does not shrink away and catches fire on contact with fire.	Curls away from flame.
2. Gives burning paper odor.	Gives burning hair odour.
3. Continues burning even after removing from flame	Stops burning after removing from flame.

5. Why are cotton clothes easy to wash? 2

Answer: Cotton fabric becomes stronger when wet. Hence, it is easy to rub hard and wash them without damaging the cloth.

6. Why is nylon used for making ropes and socks? 2

Answer: Nylon is used for aming ropes and socks because:

- It is strongest among all fibres.
- Excellent resistance to rubbing.
- Does not lose strength when wet.
- Recovery from wrinkles and creasing is fast with little ironing.

7. Give **two** examples each of natural fibres and man-made fibres. **2**

Answer:

Natural Fibres – Wool, Jute, Cotton, Silk

Man-made Fibres – Rayon, Polyster, Nylon etc

8. Identify the fabrics on the basis of the following properties. **[2]**

a. a natural fibre which is a good conductor of heat.

b. a regenerated fibre which easily absorbs moisture

Answer: a – Cotton, b – Rayon

9. Write *four* differences between cotton and silk fibre. 2

Answer: The *four* differences between cotton and silk fibre are:

Sl No.	Cotton	Silk
1.	Cotton is a vegetable fibre, obtained from plants	Silk is an animal fibre.
2.	Cotton comes from seed hair of cotton plant	Silk comes from the secretion of silkworm

Sl No.	Cotton	Silk
3.	Cotton has short fibres called staple.	Silk has long fibre called filament.
4.	It looks dull in appearance	It is smooth and shiny in appearance

10. Give *one* similarity and *one* difference between regenerated fibre and synthetic fibre. 2

Answer:

Similarity	These fibres are not obtained directly from nature, but are made by using chemicals.
Difference	• Regenerated fibres are made from natural raw material eg., cellulose, (waste cotton fibres or wood pulp) or protein, and regenerated using chemicals. • Synthetic fibres are obtained from chemical substances and are totally synthetic in nature, e.g., Nylon, Polyester, Acrylic (Cashmilon).

11. Name any *two* vegetables and animal fibres each. Also state the sources from which they are obtained. 4

Answer:

Vegetable Fibre	Animal Fibre
1. Cotton - Cotton seed hair 2. Linen – Stem of flax plant	Wool – hair of Sheep Silk – Secretion of Silk worm

12. Explain heat conduction and moisture absorption ability of silk. 2

Answer: Heat conduction and Moisture absorption ability of silk

Heat Conduction	Moisture Absorption
Poor conductor of heat making it warm fabric.	Can absorb large amount of water, without feeling damp.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13. What kind of odour and residue are obtained by burning rayon and silk fibres ? **4**

Answer: The odour and residue obtained by burning Rayon and Silk are:

Fabric	Odour	Residue
Rayon	Like burning paper	Light, fluffy, very small amount
Silk	Like burning hair	Black-bead, crushable

14. What happens to cotton and wool fibres when they are in the flame? What kind of odour and residue will you get on burning silk? 4

Answer: The inflame characteristics, odour and residue obtained by burning Cotton, Wool and Silk are:

Fabric	In-flame	Odour	Residue
Cotton	Burns quickly	Like burning paper	Light, feathery gray in color.
Wool	Burns slowly	Like burning hair	Small black bead, brittle, crushable
Silk	Burns slowly and sputters in flame	Like burning hair	Black-bead, crushable