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![](_page_0_Picture_2.jpeg)

# 5.1 TIMBERJoint Control5.2 LIMESolution Control5.3 TILES

Learning gives creativity, creativity leads to thinking, thinking provides knowledge, knowledge makes you great

-A.P.J.Abdul Kalam

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Building Materials | Timber

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### TABLE OF CONTENTS

### 5.1 Timber

- 5.1.1 Introduction
- 5.1.2 Types of Timber
- 5.1.3. Defects in Timber
- 5.1.4. Seasoning of Timber
  - Objective of Seasoning
    - Methods of Seasoning
- 5.1.5 Timber Products and their Uses
- 5.1.6 Uses of Timber in Construction

### 5.2 Lime

- 5.2.1 Introduction
- 5.2.2 Types of Lime
- 5.2.3 I.S. Classification of Lime
- 5.2.4 Uses of Lime
- 5.2.5 Difference Between Fat Lime and Hydraulic Lime

### 5.3 Tiles

- 5.3.1 Introduction
- 5.3.2 Types of Tiles and its uses
- 5.3.3. Ceramic Tiles

### 5.1 TIMBER

### Learning Objectives

At the end of this lesson you shall be able to

- State the types of timber
- Describe the defects in timber
- Explain the seasoning of timber
- State the methods of seasoning of timber
- Explain the timber and its products with uses

### 5.1.1 Introduction

Wood is one of the oldest materials used by mankind to increase the comfort and well beings. Since it is so light in weight, large structures could be built on slender foundations with help of beams of great strength.

### 5.1.2 Types of Timber

- 1. Teak Wood
- 2. Sal Wood
- 3. RoseWood
- 4. Mango Wood
- 5. Jack Wood

### 5.1.2.1 Teak Wood

Teak wood is one of the most available hard wood. It is more durable due to the presence of aromatic oil, which largely preserves it from the attack of white ants. It grows in south India and central India.

![](_page_1_Picture_38.jpeg)

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![](_page_2_Picture_1.jpeg)

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![](_page_2_Figure_3.jpeg)

### The biggest tree in the world:

General Sherman (Giant Sequoia Tree) in California's Sequoia National Park in Tulare country in the United States of California. By volume it is the largest known living single stem tree on earth.

**Volume:** 52000 cubic feet (1487 m<sup>3</sup>)

Height: 84 m

Weight: 1.9 million kilogram.

![](_page_2_Picture_9.jpeg)

### **Characteristics of Teak Wood**

- i. It shrinks very little and its fibres are straight.
- ii. It can be worked easily and finally polished.
- iii. It weighs 7700 N/m<sup>3</sup>.
- iv. Its colour is yellow to dark brown.
- v. It is one of the most valuable timber in the world.

![](_page_2_Picture_16.jpeg)

**Uses:** It is used for ship building, railway sleepers, for making furniture and railway carriages and also for structural and decorative purposes.

### 5.1.2.2 Sal Wood

It is available mostly in hilly areas of UP, Bihar, Assam and Visakhapatnam.

![](_page_2_Picture_20.jpeg)

### **Characteristics of Sal Wood**

- i. Wood is hard, close grained, heavy and durable.
- ii. Not easily attacked by white ants and seasons.
- iii. Average weight is 8600 N/m.<sup>3</sup>

**Uses:** Used in bridge construction, ship building, piles, etc.

### 5.1.2.3 Rosewood

Rosewood is dark pink in colour and it takes a high polish. It is found in Kerala, Maharashtra, Madhya Pradesh, Tamilnadu and Orissa.

![](_page_3_Picture_3.jpeg)

### **Characteristics of Rosewood**

- i. It is strong, tough and close grained.
- ii. It maintains its shape well and available in large sizes.
- iii. Its weight after seasoning is about  $7900 \text{ N/m}^3$ .

**Uses:** Used for furniture of superior quality, ornamental works, etc.

![](_page_3_Picture_9.jpeg)

### **ACTIVITY 1**

- a. Find out the oldest tree in your town and try to determine its age.
- b. Take out the cross section of timber and see the grains in it.

### 5.1.2.4 Mango Wood

This tree is very much esteemed for fruits and is found all over in India. This

wood is easily attacked by white ants and decays on exposure to wet atmosphere.

![](_page_3_Picture_16.jpeg)

### **Characteristics of Mango Wood**

- i. It can be easily designed.
- ii. It is coarse and open grained.
- iii. It is deep grey in colour.
- iv. Its average weight is 6900 N/m<sup>3</sup>.

![](_page_3_Picture_22.jpeg)

**Uses:** Used to make cheap furniture and temporary constructions.

### 5.1.2.5 Jack Wood

Its colour is yellow when freshly cut and it darkens with age. It maintains its shape well. It is found in Maharashtra and Tamilnadu.

![](_page_3_Picture_26.jpeg)

Timber | Building Materials

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### **Characteristics of Jack Wood**

- i. It is easy to work.
- ii. It gives a good finish.
- iii. Its weight after seasoning is 5950 N/m<sup>3</sup>.

![](_page_4_Picture_4.jpeg)

![](_page_4_Picture_5.jpeg)

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### The largest tree in India:

- The banyan tree (250 yearold) located in Acharya Jagadeesh Chandra Bose Indian botanic garden, Howrah near Kolkata.
- A 330 m long road was constructed around the tree to drive the visitors around the circumference of the tree. It covers 14500m<sup>2</sup> (3.5acres) area.

![](_page_4_Picture_9.jpeg)

![](_page_4_Picture_10.jpeg)

**Uses**: Used for plain furniture, boat construction, door and window panels, etc.

### **Inner parts of Timber**

![](_page_4_Figure_13.jpeg)

![](_page_4_Picture_14.jpeg)

![](_page_4_Picture_15.jpeg)

### 5.1.3 Defects in Timber

1. Star Shakes: These are the cracks which extend from bark towards the sapwood. These are wider at outside end and narrower at inside end. These are usually formed due to extreme heat or severe frost during the growth of the tree.

Building Materials | Timber

Civil\_English\_Unit\_5.indd 106

![](_page_5_Picture_0.jpeg)

2. Heart Shakes: These cracks occur at the centre of the cross section of the tree and it extends from pith to sapwood in the direction of medullary rays. These cracks occur due to shrinkage of interior part of tree which is approaching maturity. It divides the cross-section of the tree into two or four parts.

![](_page_5_Picture_2.jpeg)

**3.** Cup Shakes: Cup shakes separate the whole or part of one annual ring from another and are caused by wind and frost in the growing tree.

![](_page_5_Picture_4.jpeg)

4. Radial Shake: These are similar to star shakes and occur in felled timber when exposed to the sun during seasoning. Radial shakes are generally irregular, fine and numerous.

![](_page_5_Picture_6.jpeg)

5. Rind Galls:

![](_page_5_Picture_8.jpeg)

A peculiar curved swelling found on the body of the tree is known as rind galls. They develop at points from where branches are improperly cut-off or removed.

6. Upsets: Upsets are portions of the timber in which the fibres have been injured by crushing, bending or shocks during growth of the tree.

![](_page_5_Figure_11.jpeg)

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![](_page_6_Picture_0.jpeg)

7. Twisted Fibres:

![](_page_6_Picture_2.jpeg)

Twisted fibres are caused by the action of a prevalent wind turning the tree constantly in one direction. Timber thus injured is not fit for convertion, as so many fibres would be cut through.

![](_page_6_Picture_4.jpeg)

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8. Knots: Sometimes branches or limbs are cut off from the tree. The portion from which the branch is cut off continues to receive nourishment from the stem for a long time and it ultimately results in the formation of knots.

![](_page_6_Picture_6.jpeg)

9. Wind Crack: Wind cracks are shakes or splits on the sides of a bark of timber due to the shrinkage of exterior surface exposed to atmospheric influences.

![](_page_6_Figure_8.jpeg)

Building Materials | Timber

![](_page_7_Picture_0.jpeg)

### How to calculate the age of a live tree?

Way 1 - Try to find out when it's planted.

- Way 2 Count the numbers of branch whorls above chest height. Add 1 to your total. (Example: 4 whorls + 1 = 5 years)
- Way 3 Multiply the diameter by the growth factor.
- Way 4 Example: For White Oak tree, if the growth factor is 5 and its diameter is 22 inches, then its age is  $22 \times 5 = 110$  years.

![](_page_7_Picture_6.jpeg)

**10. Druxiness:** Druxiness is the name given to decayed spots or steaks of whitish colour in timber.

![](_page_7_Picture_8.jpeg)

### 5.1.4 Seasoning of Timber

Seasoning is the process of drying timber in a controlled condition to remove all the sap and to reduce moisture content without introducing any splits and distortion in the wood.

### 5.1.4.1 Objectives of Seasoning

- I. To reduce the weight of timber.
- ii. To make timber fit for receiving coating of paints.
- iii. To impart hardness, strength and stiffness to timber.
- iv. To make timber safe from the attack of fungi, insects, etc.
- v. To reduce the tendency of timber to warp, crack and shrink.

### 5.1.4.2 Methods of Seasoning of Timbers

- 1. Natural Seasoning
- 2. Artificial Seasoning
- 1. Natural Seasoning :

![](_page_7_Picture_21.jpeg)

In this method, timber logs are sawn into planks or other marketable sizes after felling. The sawn timber is stacked under a covered shed. Sawn timber is stacked in such a way that sufficient space is left around each sawn piece, so that free circulation of air may take place without any difficulty. Timber pieces may be stacked horizontal or vertically. But horizontally stacking arrangement is the most common method. The platform where stack is to be erected should be raised from the adjoining ground by at least 300 mm.

The stack is prepared by laying layers of sawn pieces in cross wise directions in alternate layers, length of the stack is equal to length of timber pieces. Width and height of the stack are restricted to about 1.5m and 3m respectively. A number of such stacks may be constructed under the same shed. Minimum distance between adjacent stacks should be kept about 600mm. This method of seasonings is also called "**Air seasoning**" as natural air remains circulating around each piece of the stacks and in due course of time seasoning is brought about.

![](_page_8_Picture_2.jpeg)

### 2. Artificial Seasoning

- i) Boiling
- ii) Electrical Seasoning
- iii) Kiln Seasoning
- (i) Boiling: In this method, timber is immersed in water and the water is boiled for about three to four hours. It is then dried very slowly. Instead of boiling in water, timber may be exposed to the action of hot steam. This method of seasoning proves to be costly.

![](_page_8_Picture_8.jpeg)

(ii) Electrical Seasoning: In this method high frequency alternating current is passed on timber. When timber is wet it offers less resistance to the flow of electric current. The resistance increases as the wood dries internally, which also results

![](_page_8_Picture_10.jpeg)

**Electrical Seasoning** 

Building Materials | Timber

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in the production of heat. This method is not adopted as it is not economical.

![](_page_9_Picture_1.jpeg)

How to determine the age of a dead tree?

By counting the number of rings in the log.

![](_page_9_Picture_4.jpeg)

(iii) Kiln Seasoning: This method of seasoning is carried out in air tight chambers or ovens. Converted timber pieces are stacked inside the chamber such that spaces are left for free circulation of air. Now, air fully saturated with moisture and heated about 40° c is forced inside of the chamber. The heated air gradually enters inside of the timber pieces and the moisture content in the timber is gradually reduced.

![](_page_9_Figure_6.jpeg)

### 5.1.5 Timber Products and their Uses

- 1. Veneers
- 2. Plywood
- 3. Fibre board
- 4. Particle or Light board
- 5. Hard Board
- 6. Block board
- 7. Laminated Boards

### 5.1.5.1 Veneer

Veneers are thin sheets of wood with 0.4mm to 6mm thickness obtained by different knife cutting processes. These are produced by rotary

![](_page_9_Picture_17.jpeg)

cutters where a knife blade is firmly held against a leg which is rotated. The sheets that are turned out are cut into standard sizes. Teak, sissoo, rosewood are some of the Indian timbers capable of producing high-grade veneers.

![](_page_9_Picture_19.jpeg)

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### 5.1.5.2 Plywood

Plywood is made by pasting three or more veneers having the direction of grain running at right angles to each other in alternate layers. The adhesive coated sheets are assembled and pressed together by hot press. It is then cut into different pieces of marketable sizes. It is also available in various thickness ranging from 3mm to 25mm in Moisture Resistant (MR) and Boiling Water Resistant (BWR) grades.

![](_page_10_Picture_2.jpeg)

### 5.1.5.3 Fibre Boards

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For making fibre boards, wood chips are steamed to separate fibres from each other. These fibres are blended with resin and wax and turned into sheets by passing through a pressing machine under controlled heat and pressure. It is then cut into pieces of marketable sizes. These boards are available in thickness ranging from 2.3mm to 35mm in plain MDF boards and prelaminated MDF boards. (MDF = Medium Density Fibre board)

![](_page_10_Picture_5.jpeg)

### Building Materials | Timber

### 5.1.5.4 Particle Boards

Low Density Fibre (LDF) boards are called particle boards. These are manufactured from waste wooden chips, saw mill shavings or even saw dust blended with syntheic resin or other suitable binders by pressing.

![](_page_10_Picture_9.jpeg)

### 5.1.5.5 Hard Board

Hard boards are made from wood fibres extracted form wood chips and pulped wood waste. It is also called as High-density fibre (HDF) board. These boards are stronger, denser and harder than other types of boards because, it is made by the materials which are highly compressed. Usually hard boards are 3mm in thickness.

![](_page_10_Picture_12.jpeg)

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![](_page_11_Picture_0.jpeg)

### 5.1.5.6 Block Board

Block boards are made up of a core of softwood strips. These strips may be 25mm wide. The strips are placed edge to edge and sandwiched between veneers of hardwood. The sandwich is then glued under high pressure. These boards are not suitable for outdoor use. It is available as sheets of  $2440 \times 1220$ mm in size with 30mm thickness.

![](_page_11_Picture_3.jpeg)

### 5.1.5.7 Laminated Board

Laminated boards looks very similar to blockboards but it is made up of softwood strips, 5-7mm in width. It is also sandwiched between two outer Veneers with the grains running at right angles to the core strips.

![](_page_11_Picture_6.jpeg)

![](_page_11_Picture_7.jpeg)

### 5.1.6 Uses of Timber in Constructions

- 1. It can be used in the form of vertical posts, beams, lintels, etc.
- 2. It can also be used as members of roofing trusses and rafters.
- 3. It is used as form work for cement concrete structures.
- 4. It is very much used in timbering in the deep trenches.
- 5. It is an important material for furniture making.
- 6. It is very much used in making sports goods, musical instruments, agricultural implements, etc.
- 7. It is used in making woods floors, partitions, doors and windows, etc.

### **ACTIVITY 2**

- a. Collect some small samples of different types of timber. Smell and weight it.
- b. Prepare a comparison statement for its colour, smell, weight, grains, etc.

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### **Model Questions**

### PART I (1 Mark)

### Choose the correct answer

- 1. Teak wood weight is .....
  - a. 1100 N/m<sup>3</sup> b. 2200 N/m<sup>3</sup>
  - c.  $5500 \text{ N/m}^3$  d.  $7700 \text{ N/m}^3$
- 2. The dark pink colour tree is .....
  - a. Teak wood b. Rose wood
  - c. Sal wood d. Jack wood
- 3. Natural seasoning is also called .....
  - a. Air seasoning
  - b. Chemical seasoning
  - c. Electrical seasoning
  - d. Kiln seasoning
- 4. Temperature for seasoning of timber in kiln seasoning is .....
  - a. 140°C b. 240°C
  - c. 40°C d. 110°C

![](_page_12_Picture_17.jpeg)

### PART II (3 Marks)

### Answer in one or two sentences

- 5. Write short notes on teak wood.
- 6. List three methods of artificial seasoning of timber.
- 7. What are the methods in seasoning of timber?

### PART III (5 Marks)

### Answer shortly

- 8. What are the types of trees? Explain about any one.
- 9. What are the uses of timber in construction?
- 10. What are the objects of seasoning?

### PART IV (10 Marks)

### Answer in detail

11. Write about any two timber products and their uses.

### 1. (d) 2. (a) 3. (a) 4. (c)

### erswers

Building Materials | Lime

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## **5.2** LIME

### Learning Objectives

### At the end of this lesson you shall be able to

- State the types of lime.
- Compare fat lime and hydraulic lime.
- Know the I.S.Classification of lime.

### 5.2.1 Introduction

Lime is an important binding material in building construction. Several buildings in India were constructed using lime.

### 5.2.2 Types of Lime

Generally, lime is classified into two types. They are:

1. Fat lime

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2. Hydraulic lime

### 5.2.2.1 Fat Lime

Due to high calcium content, it is called high calcium lime and it is also called as white lime and pure lime. If we get pure lime in nature it is called as quick lime. When fat lime is boiled in water the cubic content increases upto 2.5 times. This lime contains 95% calcium oxide.

![](_page_13_Picture_14.jpeg)

![](_page_13_Picture_15.jpeg)

### **Properties of Fat Lime**

- i. It hardens slowly.
- ii. Its plasticity is high.
- iii. It is soluble in water easily and quickly.
- iv. It is in pure white in colour.

### **Uses of Fat Lime**

- i. Useful for white washing on the plastered walls.
- ii. When added with sand, that lime mortar is used for brick work and stone masonry work.
- iii. When mixed with surkhi, that mortar is used in the constructions of big compound walls, basements, etc.

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### 5.2.2.2 Hydraulic Lime

![](_page_14_Picture_1.jpeg)

It sets under water. There is small quantity of clay content and iron oxide. According to the quantity of clay content, it is classified in to three types. They are:

- 1. Feebly hydraulic lime
- 2. Moderately hydraulic lime
- 3. High quality hydraulic lime

**Feebly hydraulic lime** is having 5% to 10% clay. This content is easily soluble in water. It takes 21 days to set..

**Moderately Hydraulic Lime** is having 11% to 21% clay. This content takes two hours for dissolving. It takes one or two weeks to set.

**High quality hydraulic lime** is having 21% to 30% clay. This soil will not easily soluble. But set in one (or) two days.

### 5.2.3 I.S Classification of Lime

Indian Standard Institution classified lime into 5 classes. Class A, Class B, Class C, Class D and Class E.

### **Class** A

It is an eminently hydraulic lime normally used for structural purposes. It is normally supplied as hydrated lime. This contains about 25% of clay. It is especially suitable for under water works.

### **Class B**

Semi hydraulic lime is the name contains both hydraulic lime and fat lime. It contains about 15% of clay. It is supplied both as hydrated or quick lime. It is used for mortar and concrete.

### **Class** C

It is predominantly fat lime used for finishing coat in plastering, white washing, etc., and with suitable admixtures such as surkhi (or) any other pozzolanic material to produce artificial hydraulic lime. It is supplied both quick lime and hydrated lime. This can set under water.

### **Class** D

It is the lime containing substantial proportions of magnesium oxide and is similar to fat time. It is used for finishing coat in plastering, white washing, etc.

### **Class E**

It is kankar lime generally used for masonry mortars and is supplied as hydrated lime.

![](_page_14_Picture_21.jpeg)

### 5.2.4 Uses of Lime

The following are uses of lime in construction.

- i. For white washing.
- ii. To prepare Mortar for Masonry and plastering work.
- iii. To prepare lime-sand brick.
- iv To stabilize earth.
- v As inner lining in open hearth furnace.
- vi In manufacturing of cement.

S.no	Property	Fat Lime	Hydraulic Lime
1	Main ingredient	95% calcium oxide. 5% clay soil.	5% to 30% clay soil and small quantity of ferrous oxide.
2	Slacking action	Quickly slacks. At that time volume is increased upto two times. Heat and sound occurs.	Slow slaking property. No sound and heat releases when slakes.
3	Setting action	Slow setting property. Absorbs carbon-di-ox- ide from the atmosphere and converts as calcium carbonate.	Sets under water. It changes as tricalcium aluminate and di calcium silicate when com- bines with water.
4	Hydraulic property	No hydraulic property.	Possess hydraulic property.
5	Colour	White.	Moderate white
6	Strength	Not so hard.	Highly hard.
7	Uses	Useful for white washing.	To prepare mortar used for the masonry work in water logged areas.

### 5.2.5 Difference Between Fat Lime and Hydraulic Lime

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### **Model Questions**

### PART I (1 Mark)

### Choose the correct answer

- 1. The lime contains ..... calcium oxide.
  - a. 50%
  - b. 70%
  - c. 85%
  - d. 95%
- 2. Several buildings in India were used ...... for construction.
  - a. Sand
  - b. Lime
  - c. Line
  - d. Clay
- 3. Increasing in volume when fat lime is boiled in water is ......
  - a. 2.5 times
  - b. 3.5 times

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- c. 4.5 times
- d. 5.5 times

![](_page_16_Picture_18.jpeg)

### PART II (3 Marks)

### Answer in one or two sentences

- 4. What are the types of lime?
- 5. Write the uses of fat lime.

### PART III (5 Marks)

### Answer shortly

6. Explain the IS Classification of lime.

### PART IV (10 Marks)

### Answer in detail

7. Write the difference between fat lime and hydraulic lime.

(a) .£ (d) .2 (a) .1

Part – I Answers

Building Materials | Tiles

# 5.3 TILES

![](_page_17_Picture_1.jpeg)

At the end of this lesson you shall be able to

- State the types of tiles.
- Understand the uses of tiles.

### 5.3.1 Introduction

Tiles are used for various purposes in building industry. They are thinner than bricks and hence should be carefully handled to avoid any damage.

### 5.3.2 Types of Tiles and Their Uses

1. Drain tiles

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- 2. Floor tiles
- 3. Roof tiles

### 5.3.2.1 Drain Tiles

These tiles are prepared in such a way that they retain porous texture after burning. If the tiles are used in water logged areas, they allow sub soil water to pass through their holes. They are also used to convey irrigation water. Such drain tiles are rarely adopted in modern times.

![](_page_17_Picture_14.jpeg)

### When was the first tile made? In 14000 BC the first tile was made at Mesopotamia in Iraq.

The maximum size of a tile was 300 cm  $\times$  150 cm – giant tiles

**Search link**: www.granitifiandre.com> porcelaintile

![](_page_17_Picture_18.jpeg)

![](_page_17_Picture_19.jpeg)

### 5.3.2.2 Floor Tiles

Floor tiles may be square or rectangle in shape. These are flat tiles and their thickness varies from 6.5 mm to 14 mm. As the floor tiles are hard and tough, there is minimum wear and tear. To prepare coloured floor tiles, colouring substance is added in the clay at the time of its preparation. Floor tiles

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of comparatively less thickness can be adopted for fixing on walls.

![](_page_18_Picture_1.jpeg)

![](_page_18_Picture_2.jpeg)

![](_page_18_Picture_3.jpeg)

![](_page_18_Picture_4.jpeg)

![](_page_18_Picture_5.jpeg)

### 5.3.2.3 Roof Tiles

These tiles are used for covering of pitched roof. Several kinds of roof tiles are available. They are:

- Allahabad Tiles
- Corrugated tiles
- ➢ Flat tiles
- Flemish tiles
- Mangalore tiles
- > Pan tiles
- ➢ Pot tiles

### 5.3.2.3.1 Allahabad Tiles

These tiles are made as two portions. The edges of the base portion is with projecting upward ribs. Its size reduced from 27 cms to 23 cms. The length is 38 cms. The top portion is in the shape of semi-circle. Its diameter reduces from 15.5 cms to 12 cms. It is made up of high quality clay by hydraulic pressing and burning..

![](_page_18_Picture_17.jpeg)

![](_page_18_Picture_18.jpeg)

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### 5.3.2.3.2 Corrugated Tiles

These tiles have corrugations. Hence it is called corrugated tiles. When these tiles are placed on the roof, it is enough to overlap two corrugations to join each other. These are made by galvanized iron sheets and cement mixed with asbestos fibres.

![](_page_19_Picture_2.jpeg)

### 5.3.2.3.3 Flat Tiles

These are like ordinary floor tiles. These are used to lay on the terrace above the weathering course. It is some time used as under tile in pitched roof.

![](_page_19_Picture_5.jpeg)

### 5.3.2.3.4 Flemish Tiles

These tiles are moulded in the shape of 'S'. It is also used to lay in pitched roofs.

![](_page_19_Picture_8.jpeg)

### 5.3.2.3.5 Mangalore Tiles

![](_page_19_Picture_10.jpeg)

To drain water, the red colour Mangalore tiles are moulded with two channel like structure. To join the tiles with each other, there will be a upward projection in the side of tiles.

![](_page_19_Picture_12.jpeg)

By using Mangalore moulds, ridge, hip, chimney portion tiles are designed.

![](_page_19_Picture_14.jpeg)

![](_page_19_Picture_15.jpeg)

Files | Building Materials

As this tiles are coming from Mangalore of Karnataka state to Tamilnadu, these are called Mangalore tiles. This tiles are also manufactured in Cochin, Calicut of Kerala state. Maximum 24% of water can be absorbed by "A" class Mangalore tile.

ACTIVITY 4 Prepare an album by pasting different types of floor, roof, and drain tiles.

### 5.3.2.3.6 Pan Tiles

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These are small and hard. When compared to pot tiles, they have minimum undulations. Good quality tiles are manufactured by moulding, drying and burning. The length is 33 cm to 38 cm. The breadth is 23cm to 28cm.

![](_page_20_Picture_4.jpeg)

Building Materials | Tiles

### 5.3.2.3.7 Pot Tiles

![](_page_20_Picture_7.jpeg)

These are ordinary semi-circular country tiles. As this tiles are made by Pot makers, they are called pot tiles. These tiles are small and comfortable to handle. So, it is called hand tiles in Tamil Nadu. These tiles are easily breakable.

![](_page_20_Picture_9.jpeg)

### 5.3.3 Ceramic Tile

Ceramic tile is made up of sand, natural clay, and water. Once it has been moulded into shape they are then fired in kiln. Ceramic tiles can either be glazed or unglazed. In buildings, ceramic tiles are used as floor andn wall tiles. Common types of ceramic tiles used in construction are :

- 1. Ceramic floor tiles
- 2. Ceramic terracing tiles
- 3. Ceramic ceiling tiles
- 4. Glazed ceramic tiles
- 5. Fully vitrified tiles
- 6. Porcelain tiles

**Ceramic Terracing Tiles:** These tiles are flat tiles made up of well prepared and weathered clay and burnt in a kiln. They should be burnt uniformly. They can be hand-made or machine pressed. Usual sizes are  $200 \times 200 \times 15$ mm and  $150 \times 150 \times 15$  mm. The thickness may vary from 15 - 20 mm.

![](_page_21_Picture_1.jpeg)

**Glazed Ceramic Tiles:** These are of earthenware, having top surface glazed and underside unglazed, so that tile may adhere properly with the surface. A glaze is applied in order to improve the appearance, making it non-absorbent and increasing its durability. These tiles are made in different sizes.

![](_page_21_Picture_3.jpeg)

**Fully Vitrified Tiles:** Vitrified tile is the ceramic tile with low porosity. It is an alternative to marble and granite flooring. These tiles are often used in outdoors due to their water and frost resistance. They are extremely durable and are made to endure heavy traffic.

Since the edges of these tiles are uniform, they can be laid with very close joint.

![](_page_21_Picture_6.jpeg)

![](_page_21_Picture_7.jpeg)

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### **Model Questions**

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### PART I (1 Mark)

### Choose the correct answer

- 1. The thickness of ceramic terracing tiles varies from .....
  - a. 15mm to 20mm
  - b. 2mm to 300mm
  - c. 5mm to 400mm
  - d. 6mm to 100mm
- 2. Mangalore tiles are also manufactured in the states of .....
  - a. Tamil Nadu & Andhra
  - b. Kerala & Tamil Nadu
  - c. Andhra & Kerala
  - d. Karnataka & Kerala

![](_page_22_Picture_13.jpeg)

### PART III (5 Marks)

### Answer shortly

- 3. What are the types of tiles?
- 4. What are the types of roof tiles?

### PART IV (10 Marks)

### Answer in detail

5. Elaborate about ceramic tiles?

Part – I Answers

Building Materials | Tiles

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