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### C) Anatomy of Pinus stem:-

In many respect stem anatomy of Pinus resembles with dicot stem. General arrangement of various tissues is the same. Details are as follows -

- 1) Epidermis: It has irregular outline. It is single layered, thick walled and heavily cuticularized.
- 2) Hypodermis: Few layers are present which are made up of large, sometimes thick walled and lignified cells. They are found lying below the epidermis.
- 3) Cortex:- Many layered. cortex is made up of more or less rounded cells with conspicuous resin ducts.
- 4) Endodermis & Pericycle:- They are not marked out.
- 5) Vascular Bundles:- They are collateral, conjoint and open. V. bundles are found arranged in a ring as in dicots. Each V. bundle consists of phloem, cambium & xylem.
  - a) Phloem - Phloem consists sieve tubes, phloem parenchyma and some albumin cells. Companion cells are absent from phloem. It lies on the outerside of the V. bundle.
  - b) The Cambium:- Few layers of <sup>meristematic tissue having</sup> thin walled, rectangular cells are found lying between xylem and phloem.

On Line Study Material (e-content)

(17)

College: S.S. college, Jehanabad

Date - 09.07.2020

Department: Botany

Time - 11:00 - 12:00

Subject: Gymnosperm

Teacher's name: Dr. S.S. Sharma

Topic: Anatomy of different parts of Pinus.

Class - Biotech. PI - Sub.

Medium of study: WhatsApp & college website.

& B.sc(Bot) HP2 - How.

Anatomy of different parts of Pinus.

B. T.S. old Root:-

T.S. of old root shows Secondary growth. It occurs due to the activity of cambium in outer and inner side.

- On the outside few layers of cork while towards the inner side secondary cortex are cut due to the activity of <sup>Cork</sup> cambium. Many resin canals and stone cells are found in the sec. cortex.

- In the cambial region sec. phloems are cut towards outside and sec. xylem towards the inner side.

- Crushed primary phloem is present outside the sec. phloem.

- Many uniseriate medullary rays are present in the sec. xylem.

- Primary xylem is the same as in young roots.

→ Pro

Fig.