



## HIGHER SECONDARY PRACTICAL EXAMINATION – BOTANY

HSE II

Time -1 ½ hrs

Score – 20

1. Prepare a T.S of the given specimen A and identify giving reasons. Draw the ground plan and label the parts. Leave the preparation for valuation. (Score – 6)

Preparation – 2 , Labelled diagram - 1½ , Identification - ½ , Reasons - 2

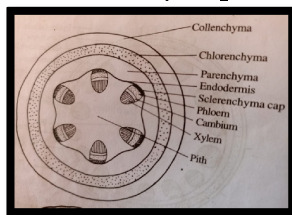
**Material A :** Dicot stem / Monocot stem/ Dicot root/ Monocot root

Answer :-

➤ **Dicot stem** -Section



Ground plan :-

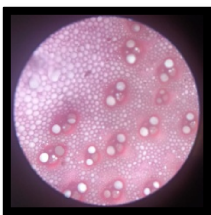


Identification :- The given material is dicot stem

Reasons :-

- Conjoint vascular bundle
- Endarch xylem  
hence it is a stem.
- Limited number of vascular bundles arranged in the form of a ring
- Open vascular bundle  
hence it is a dicot stem

➤ **Monocot stem** – Section



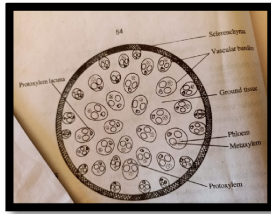
Identification :- The given material is monocot stem

Reasons :-

- Conjoint vascular bundle
- Endarch xylem  
hence it is a stem
- Numerous , Scattered vascular bundles
- Closed vascular bundle  
- hence it is a monocot stem



Ground plan

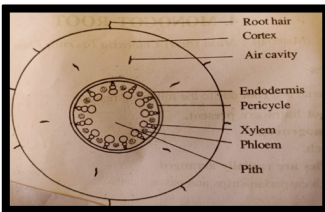
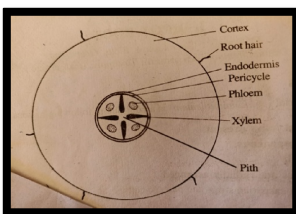
➤ **Monocot root** - Section

**Identification :-** The given material is monocot root

**Reasons :-**

- Radial vascular bundle
- Exarch xylem  
hence it is a root
- Numerous xylem & phloem groups
- Round shaped xylem  
hence it is a monocot root

Ground plan

➤ **Dicot root** – Ground plan

**Identification :-** The given material is Dicot root

**Reasons :-**

- Radial vascular bundle
- Exarch xylem  
hence it is a root
- 2-6 xylem & phloem bundles
- Polygonal shaped xylem  
hence it is a dicot root

**2. Identify the material B & C at sight by giving reasons. (Score –2)**

Identification –  $\frac{1}{2} \times 2 = 1$ , Reason –  $\frac{1}{2} \times 2 = 1$

**Material B :-**

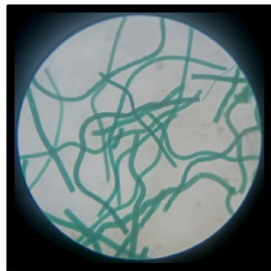
**Microscopic slides** - Oscillatoria / Rhizopus / Spirogyra / Moss protonema / Fern prothallus /

**Macroscopic specimens** - Agaricus / Sargassum / Funaria-gametophyte with sporophyte / Nephrolepis sporophyte / Pinus male cone / Pinus female cone



Answer :-

➤ **Oscillatoria**



Identification :- Oscillatoria filament

Reason :-

- Filamentous blue green algae
- Filaments with necridium

➤ **Rhizopus**

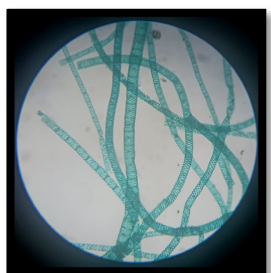


Identification :- Rhizopus – mycelium with sporangia

Reason :-

- Spores are produced in sporangia
- Sporangia are borne on sporangiophore

➤ **Spirogyra**

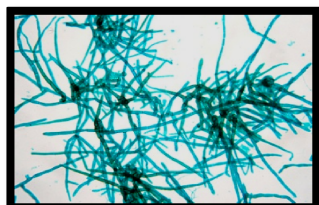


Identification :- Spirogyra vegetative filament

Reason :-

- Cells have ribbon shaped chloroplasts
- Filamentous green algae

➤ **Moss protonema**



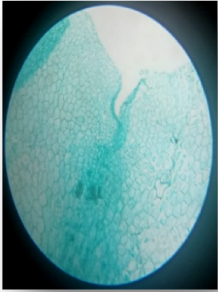
Identification :- Moss protonema

Reason :-

- Branched thread like structure , grows from spore
- Gametophyte of bryophyte



➤ Nephrolepis / Fern prothallus

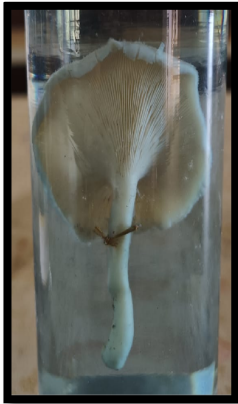


Identification :- Nephrolepis / Fern prothallus

Reason:-

- Heart shaped structure.
- Gametophyte of pteridophyte

➤ Agaricus



Identification :- Agaricus basidiocarp

Reason :-

- Umbrella shaped structure
- Basidiocarp produce basidiospore

➤ Sargassum



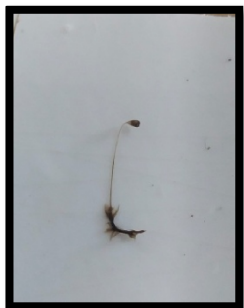
Identification :- Sargassum thallus

Reason :-

- Erect & branched thallus
- Thallus is differentiated into holdfast, stipe & frond



➤ **Funaria – gametophyte with sporophyte**

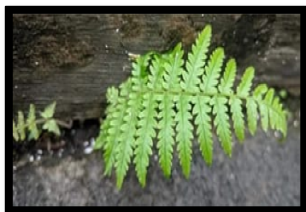


Identification :- Funaria – gametophyte with sporophyte

Reason :-

- Plant body consists of gametophyte & sporophyte
- Gametophyte differentiated into root like, stem like & leaf like parts
- Sporophyte differentiated into foot, seta & capsule

➤ **Nephrolepis / Fern sporophyte**

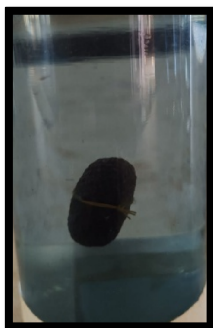


Identification :- Nephrolepis / Fern sporophyte

Reason :-

- Sporophytic plant body is differentiated into root, stem & leaves.
- Spores are released from sporophylls

➤ **Pinus male cone**



Identification :- Pinus male cone

Reason :-

- Male reproductive organ , which consists of microsporophylls.
- Smaller than female cone



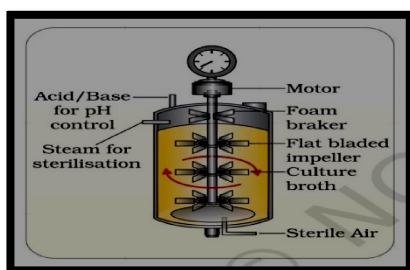
➤ **Pinus female cone**

**Identification** :- Pinus female cone

**Reason** :-

- Female reproductive organ, which consists of megasporophylls.
- Larger than male cone

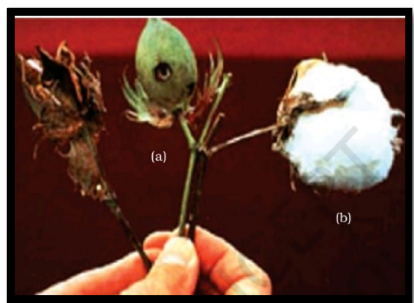
**Material C** :- Photograph of Bioreactor / Bt cotton / Cloning vector



**Identification** :- Bioreactor

**Reason** :-

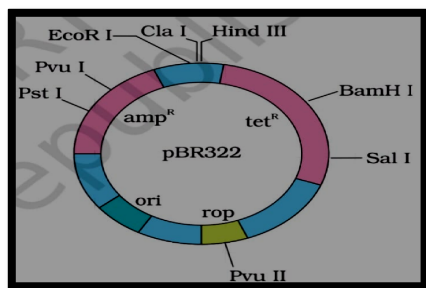
- Large vessel in which raw materials are biologically converted into products
- Used to produce proteins in large quantities



**Identification** :- Bt cotton

**Reason** :-

- Bioinsecticide
- Transgenic cotton plant with *cry* gene



Identification :- Cloning vector

Reason :-

- Vehicle which carry foreign gene into host
- Contain Ori site, selectable marker & single recognition sequence

3. Identify the given stage D of mitosis and give reasons. (Score – 1)

Identification –  $\frac{1}{2}$ , Reason –  $\frac{1}{2}$

**Material D** :- Prophase / Metaphase / Anaphase / Telophase

Answer :-



Identification :- Prophase

Reason :-

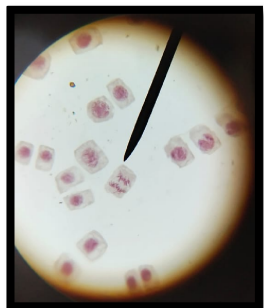
- Nuclear membrane & Nucleolus dis organize
- Chromatin reticulum condenses to form chromosome



Identification :- Metaphase

Reason :-

- Chromosomes are arranged at equator
- Spindles fibres arised from each poles & attached to kinetochore of centromere



Identification :- Anaphase

Reason :-

- Centromere split
- Chromatids move towards opposite poles.



Identification :- Telophase

Reason :-

- Nuclear membrane & Nucleolus re organize
- Chromosomes decondenses to form chromatin reticulum

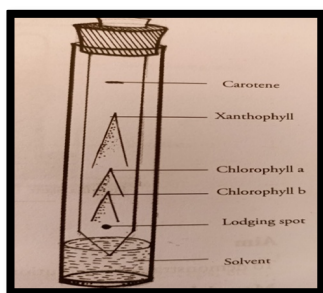
4. Write the aim of the experiment E. Draw & label the parts. (Score – 1 ½)

Aim – ½, Labelled diagram – 1

**Material E** :- Physiological experiments - Paper chromatography / Hydrilla experiment / Study of stomata on leaves / Yeast fermentation and production of alcohol

Answer :-

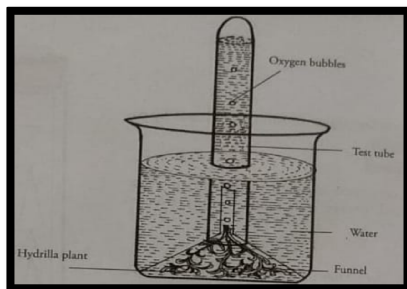
➤ Paper chromatography



Aim :- To separate plant pigments from leaves

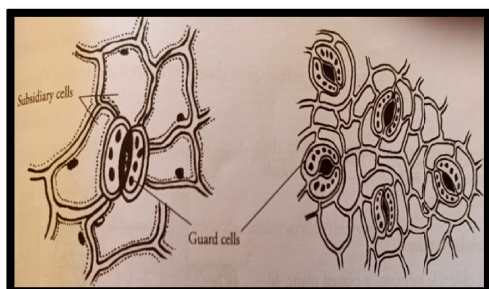


➤ **Hydrilla experiment**



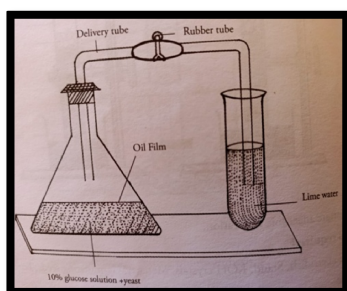
**Aim** :- To demonstrate evolution of Oxygen during photosynthesis

➤ **Study of stomata on leaves**



**Aim** :- To study distribution of stomata on both surfaces of leaves.

➤ **Yeast fermentation and production of alcohol**

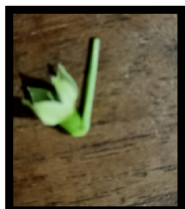


**Aim** :- To demonstrate Yeast fermentation & production of alcohol

5. **Observe the given flower F. Describe its floral whorl , Calyx / Corolla / Gynoecium using technical terms ( 3 technical terms)** (Score - 1 ½)

**Material F** :- Single flower of family Solanaceae

Answer :-



**Calyx** :- 5 Sepals, Gamosepalous, Valvate aestivation

**Corolla** :- 5 Petals, Gamopetalous, Valvate aestivation

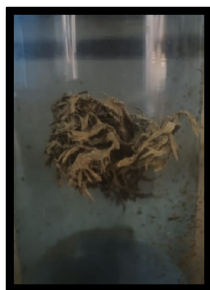
**Gynoecium** :- Bicarpellary, Bilocular, Syncarpous, Superior ovary, Axile placentation (any 3)

6. Write down the ecological interaction of the specimen G. (Score – 2)  
Name of interaction – 1, Description – 1

Answer :-

**Material G** :- Lichen / Cuscuta / Loranthus / Epiphyte

➤ **Lichen** :-



**Interaction** :- Mutualism / Symbiosis

- Both organisms get benefit (+ + interaction)
- Lichens are symbiotic association between algae & fungi

➤ **Cuscuta**



**Interaction** :- Parasitism

- Total stem parasite with yellow stem . No leaves.
- One organism (cuscuta) get benefit & the other organism (host) is harmed (+ - interaction)





➤ **Loranthus** :-



Interaction :- Parasitism

- Partial stem parasite
- One organism (Loranthus) get benefit & the other organism (host) is harmed (+ - interaction)

➤ **Epiphyte** :-



Interaction :- Commensalism

- One organism (Epiphyte) get benefit & the other organism neither benefitted nor harmed (+ 0 interaction)
- Epiphyte depend on other plant only for shelter. They do not absorb food & water

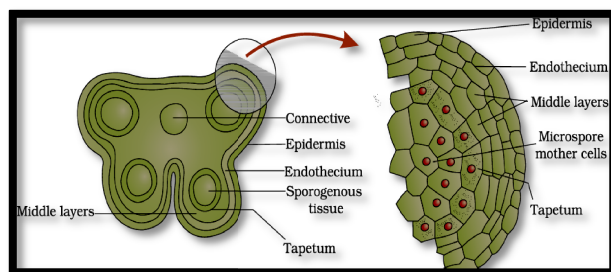
7. Prepare a C.S of the given specimen H. Draw diagram and label any 2 parts.

Leave the preparation for valuation.

(Score – 3)

Section – 1, Labelled diagram – 2

Answer :-



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