Chhatrapati Shahu Ji Maharaj University, Kanpur

Answer Script Details
Barcode 6433479

Roll No. 24062000472
Total Mark 49/75.00

Exam MASTER OF SCIENCE _ODD EXAM-DEC-24
Subject B040702T - DIVERSITY OF ALGAE AND BRYOPHYTES

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	0/5						
1B	4/5						
1C	3/5						
1D	4/5						
1E	3/5						
1F	3/5						
1G	3/5						
1H	3/5						
1I	4/5						
2	10/15						
3	NA/15						
4	NA/15						
5	NA/15						
6	12/15						
7	NA/15						
8	NA/15						
9	NA/15						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-II

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										
Total Marks in Figures									Max. Marks	
Total Marks in Words										

Paper Code: B 0 4 0 7 0 2 T

Signature of Evaluator

Date of Exam: 23/01/25 Shift: I Room No.: 25

Paper Code: 6040702T Subject: Diversity of Algae & Bryophytes Year/Sem: I

Name of Candidate: NANCY RATHI

Roll No.: 2 4 0 6 2 0 0 0 4 7 2

COE Facsimile

Signature of Invigilator

Signature of Candidate

Course: Diversity of Algae & Bryophytes (MSC-I) (Botany)

Session: 2024-25 Year/Semester: I

Subject Name: Diversity of Algae & Bryophytes

Medium: English ● Hindi ○

Paper Code: B 0 4 0 7 0 2 T

Exam Date: 2 3 0 1 2 0 2 5

Name of Candidate: N A N C Y R A T H I

Father's Name: G A Y A P R A S A D R A T H I

College Code: K N 0 4

Exam Centre Code: K N 0 4

Type of Exam: Regular ● Ex-Student ○ Private ○ Back Paper Exam ○

ANSWER BOOKLET NO.: 6433479

Paper Code: B 0 4 0 7 0 2 T

Enrollement Number: C S J M A 2 4 0 0 0 1 3 1 6 5 8

Candidate's Roll Number: 2 4 0 6 2 0 0 0 4 7 2

Paper Code: B 0 4 0 7 0 2 T

Signature of Candidate

Signature of Invigilator

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नोट- 1. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पत्रे के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. बॉक्स में भरी जाने वाली प्रविष्टियाँ काली स्याही से भरी जायें। 3. गोलों को काले या नीले बॉलपेन से भरा जायें।

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below, blacken thecircles completely.

4. Make no Stray marks o n this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

IN ORDER TO AVOD UFM (UNFAIR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tampering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/electronic/digital/ watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

अनुचित साधन से बचने हेतु :

1. उत्तर पुस्तिका के निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखे तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेड़ छाड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़ें, मोबाईल, डिजिटल डायरी, डिजिटल घड़ी, कापी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संबंधित प्रश्नपत्र में ही मेमोरी लेस साइंटिफिक कैलकुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में कागज न रखें न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थियों को विशेष निर्देश

1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र ID सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ (1-24) से कम है या कटे हुए हैं, तो परीक्षा शुरू होने के पूर्व दूसरी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके परीक्षा शुरू होने के 30 मिनट के अन्दर कक्ष निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई बदलाव नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. भी कोपी या अतिरिक्त ग्राफ नहीं दिया जायेगा।

INSTRUCTION TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-24) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Subj Name, and Question of the Question Paper during first THIRTY MINUTES of the commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in status as Carry Over. Those appearing as Ex- Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.

	1	8	1	5	4	3	2	1	6	9
0	0	0	0	0	0	0	0	0	0	0
1	●	1	●	1	1	1	1	●	1	1
2	2	2	2	2	2	2	●	2	2	2
3	3	3	3	3	3	●	3	3	3	3
4	4	4	4	4	●	4	4	4	4	4
5	5	5	5	●	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	●	6
7	7	7	7	7	7	7	7	7	7	7
8	8	●	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	●

Note- If your Roll No. is of 10 digits. Please leave first three columns .

Paper Code
B 0 4 0 7 0 2 T

1

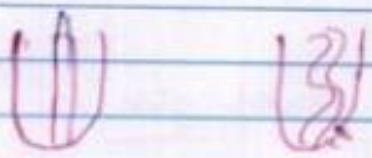
Section → C

Q6. Q6

General characters of Bryophytes :-

- Bryophytes are called as amphibian of plant kingdom because they are present in both ta terrestrial and aquatic ecosystem.
- they have both gametophyte and sporophyte stages.
- gametophyte is dominant and sporophyte is dependent upon gametophyte.
- Gametophyte is haploid & sporophyte is diploid.
- Embryo is formed in bryophytes.
- they do not have vascular system.
- they are have follicle or thalloid body.
- Sporophyte mostly contains foot, seta and capsule.
- Rhizoids are present in the Bryophytes roots are absent in bryophyte.

Rhizoids are used for anchorage of the water and minerals.
Rhizoids can be smooth or tuberculated.



Smooth rhizoid — Tuberculated rhizoid

- Scales are also present in some bryophytes scales can be example of appendicular.
- Rhizoid → Unicellular → Hepaticopsida
  → Anthocerotopsida
  → Multicellular → Bryopsida
- they show alternation in generation.
- Elaters are also present in some Bryophytes.
- Bryophytes are present in vast diversity of habitat.
- Gametophyte plant body releases gametes (Male & female) i.e., egg & Antherozoids which fuse together and form zygote and after that embryo which forms (2n) Sporophytic plant body which forms spores (Haploid) & after meiosis and on germination of spores it forms male & female gametophyte.

Paper Code

3

classification of Bryophyta

Bryophytes are classified into three classes :-

- (1.) Hepaticopsida
- (2.) Anthocerotopsida
- (3.) Bryopsida

(1.) **Class Hepaticopsida** (Liverworts)

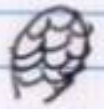
this class is called as Hepaticopsida because Hepatica means liver and these have shape like that.
Plant body is foliose dichotomous mostly.
Columella is absent.
Elaters are present.
Rhizoids are present which can be

- Simple Rhizoids
- Tuberculated Rhizoids

Rhizoids are for the absorption water & nutrient from the soil/surface.

Sex organs are present in the dorsal surface of the plant body.

elaters are present.
Capsule wall is mostly single layer.
Capsule wall does not contain stomata.
Scales are present which can be appendiculate or simple.



Simple scale

Appendiculate scale

Marchantia's sporophyte contain foot, seta & capsule.
In Sporophyte of Riccia only capsule is present foot & seta are absent.

They are divided into four order:-

1. Marchantiales
2. Jungermanniales
3. Calobryales
4. Sphaeroparpales

(2) Class Anthocerotopsida

- Columella is present.
- Pseudo elaters are present in the sporophyte of Anthocerotopsida.

- Foot and capsule are only present.
- Seta is absent.
- capsule wall is double layered.
- Sex organs Antheridia generate from hypodermal cell and oogonia from superficial cells present on the dorsal surface.
- Only smooth Rhizoids are present.
  Scales are not present.

↳ there is only 1 order in Anthercerotopsida i.e.,
↳ Anthocerotales.

(3.) Class Bryopsida

~~Bryopsida have foot seta~~
Bryopsida is the largest class of the Bryophyte. Sporophyte of Bryopsida have foot, seta & capsule.
Columella is present.
Elaters are absent.
it's body have long slender with leaves like structure and sex organ present at the apical portion.

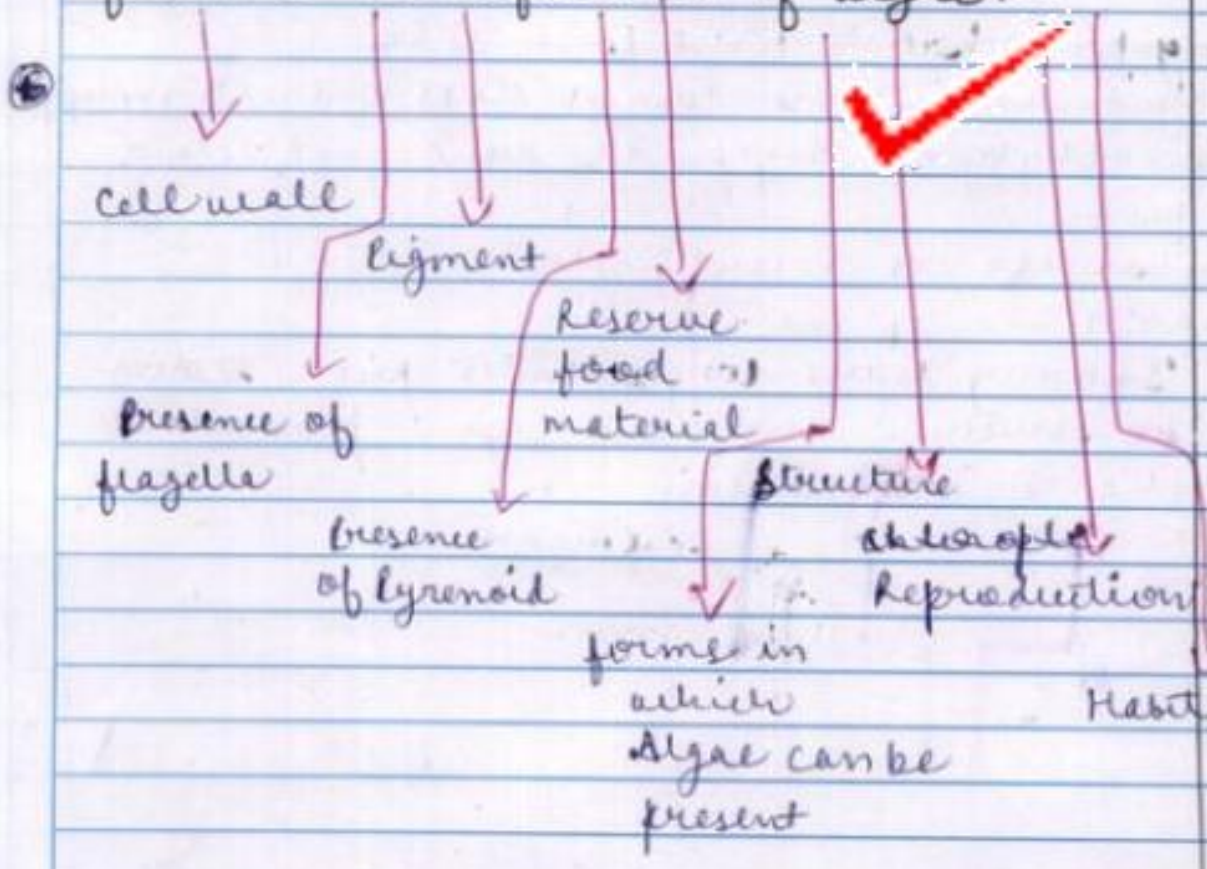
Paper Code

Section B

Q2. Q2

Algae are also called sea weeds as vast variety of Algae is found in different habitats. So its classification was also not very easy. many scientists gave its classifications. but most acceptable (widely) accepted classification is of Fritsch.

Fritsch used the following criteria for the classification of algae:—



Paper Code

7

Dey Fritsch divided algae into 11 classes:-

1. Chlorophyceae
2. Xanthophyceae
3. Phaeophyceae
4. Rhodophyceae
5. Myxophyceae
6. Dinoflagellate
7. Euglenophyceae
8. Bacillariophyceae
9. Cryptophyceae
10. Chrysophyceae
11. Chloromonidinae

(1) class chlorophyceae (Green algae)

chlorophyceae present in the mostly fresh water forms.
cell wall made up of cellulose.
Pigments present is chlorophyll a & chlorophyll b.
Reserve food material is present in the form of Starch.
flagella are present. the number of flagella is two. the flagella are equal.
they show vegetative, asexual & sexual reproduction. Sexual reproduction is isogamous, Anisogamous & oogamous.
Pyrenoids are present.

(2) (2) Class Phaeophyceae (Brown algae)

flagella → 2 ~~Unequal~~

Mostly present in marine water.

cellulose composed of ~~cellulose~~ algin.

Pigment present is chlorophyll a & chlorophyll c & fucoxanthin.

Brown color of ~~Exo~~ Phaeophyceae is due to fucoxanthin.

Pyrenoids are ~~not~~ present ~~are~~ as they are stalked.

Reproduction is ~~Vegetative~~ Asexual and sexual.

Reserve food material → Laminarin & Mannitol.

(3.) (3) Class Rhodophyceae

these are called red algae.

Mostly present in Marine water.

~~Color~~ Pigment present is chlorophyll a, chlorophyll b, fucoxanthin.

Pyrenoids are present in Rhodophyceae

flagella are absent in Rhodophyceae.

Reserve food material in the form of ~~Floridic~~ floridian starch.

Paper Code

9

① Class:-

(1.) **Myxophyceae**

they are called blue green g algae or cyanobacteria.
cell wall is composed of Polysaccharide & Muramic acid just like Bacteria.
the ~~pigm~~ pigment present is chlorophyll a & phycobilins. (phycocyanin & phycoerythrin).
Reserve food material → cyanophycean granules.
does not have flagella.
~~stalk~~

⑤ Class Xanthophyceae

(5.)

Xanthophyceae are yellow in color.
Pigment present in Xanthophyceae is chlorophyll a, chlorophyll c & xanthophyll.
Pyrenoids absent.
Reserve food material → oil droplets.
cell wall mostly consists of pectin.

⑥ Class:-

(6.) **Chrysophyceae**

they are orange in color.
cell wall made of mostly silica.
the pigment present is chlorophyll a, chlorophyll c.
Reserve food material present in the form of Leucosine & fats.
Pyrenoids present.
flagella present

(B) (8) Class Bacillariophyceae (Diatoms)

Cell wall consists of silica, pectin - mostly.
they are cosmopolitan in nature present world wide.
they reproduce through cell division and auxospore formations.
Pyrenoid present
flagella → single, pentanematic type
Pigment present is chlorophyll a, chlorophyll c, xanthophyll.
Reserve food material is in form of fats; volutin.

(9.) (5.) Class Cryptophyceae

cell wall is absent.
they are unicellular.
they reproduce by the binary fission and sometimes in rarely sexual reproduction and if sexual reproduction present it is isogamous
Pigment present is chlorophyll a, chlorophyll c.
Reserve food material in form of starch and oil.
Pyrenoid present.
flagell present (2).

(10) Class chloromonidinae

— they are unicellular.
they reproduce by cell division
xanthophyll is the pigment present in the excess.
pyrenoids are absent.
flagella are present (2).
reserve food material is fats and oil.

(11.) Class Euglenophyceae

cellwall is proteinaceous.
pyrenoid present..
flagella (single or 2)
reserve food material polysaccharide in some.
chlorophyll a, chlorophyll b is
Neoxanthin is the pigment present in

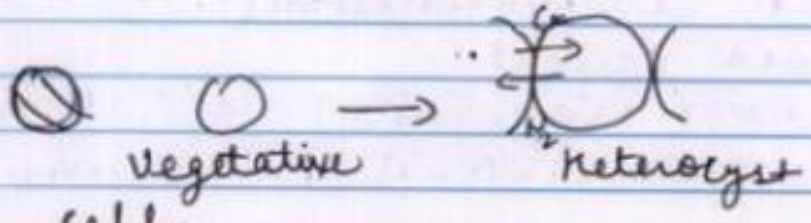
Pt 0

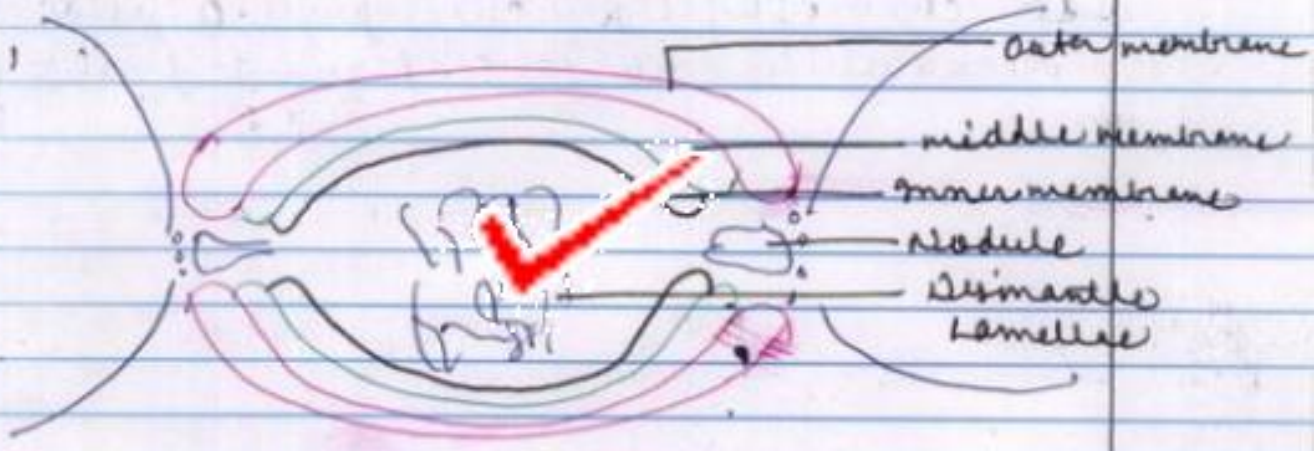
SECTION → A

(B.) (b) Heterocyst

Heterocyst is present in some cyano-bacteria which fix the nitrogen for eg:- Nostoc, Anabaena etc.

the vegetative cell enlarges in the size & forms heterocyst in some cyanobacteria.





Structure of Heterocyst

Paper Code

13

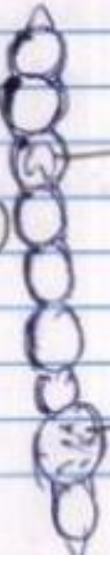
Heterocyst consists of outer mucilagious membrane, middle membrane & inner thin membrane.
these membranes go thick on the polar ends in which they are connected through nodule.
Desmantle lamellae is present in the heterocyst.
Phycobilins are not present in Hetero-cyst.

Vegetative cell cell which are going to form heterocyst is called pro heterocyst.
Red light & white light accelerates the heterocyst formation.

Nitro presence of N2 compound Nitrogen is inversly proportional to the heterocyst formation.

Heterocyst cells in fixing the atmospheric Nitrogen.

Heterocyst in Anabaena (cyanobacteria)



(c.) (c)

~~Cyanophyceae show affinity with~~

Cyanophyceae is kept in Algae in classification by some scientist but some keep Cyanobacteria in Bacteria; as it shows affinities with both Algae and Bacteria.

Affinites with Bacteria

cell wall present in Cyanophyceae is just like Bacteria.

Prokaryotic nature of cyanophyceae is like Bacteria.

Nucleus is without membrane

Ribosome is 70S type

~~Algae~~

Affinities with Algae

Pigment present chlorophyll which is just like algae.

Cyanophycea have chlorophyll present

Cyanophycea are autotrophic like algae.

Cyanophycea can fix Nitrogen.

Paper Code

15

(D.) (D) Algae in industry

(i) Agar Agar

Is formed by Rhodophycea mainly

↓

Glacilaria, Gelidium etc.

Agar Agar is used as chemical substrate in microscopic many process.

Agar Agar is used for the treatment of constipation.

Agar Agar has the melting temp 90 – 100°C so it is used in many processes in Bio technology

(ii) Carengeen

It is formed by some Algae it is used in paints, brushes etc.

(iii) Funori

In Japan called funari

It is also made by algae.

It is used as adhesive.

(iv) Algin

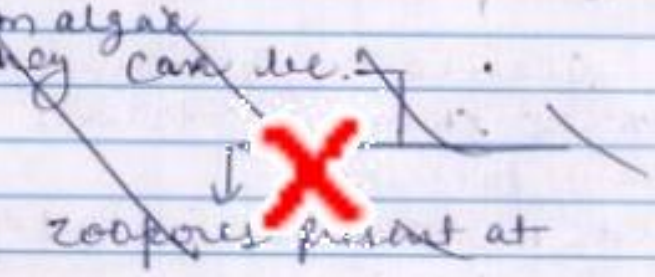
It is also sodium made by Algae used in cosmetics, paints etc.

(E.) (E)

Zoospores

Motile spores in which (flagella) are present are called zoospores.

in algae they can be.



zoospores present at

Number of zoopore differ in different algae which and position, also differs of flgella

- in chlamydomonas ~~two zoospores present at apical portion~~

two flagella present in zoopsope apical portion

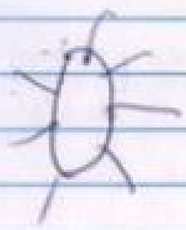
- in zoospores 2 flagella can be present laterally

P.t.O

• 120 ~~number of~~

• Quadriflagellate zoospores can also be present.

• Multiflagellate zoospospores can also be present



Vaucheria

Aplanospore → these are the non-motile spore present ~~and~~ ~~which~~ dry period ~~(algae)~~ (for example algae) can perform asexual reproduction

By Aplanospore ~~the~~ the asexualle reproduction takes place.

P.t.O

Turn Over

Paper Code

c.) (b)

Peat moss

Peat moss is the dried Sphagnum

~~Sphagnum~~ Peat moss is used in variety of things.

Sphagnum is the member of Bryopsida.

Peat moss which is dried form of Sphagnum is used in maintaining fertility of soil.

Peat moss have very good water holding capicity so it is very good for maintaing soil humidity. It ~~be~~ Peat moss helps clayey soil in improving its texture and it helps sandy soil in improving it's water holding capicity.

Peat The acid which is released from peat is helpful in the treatment of herpes virus.

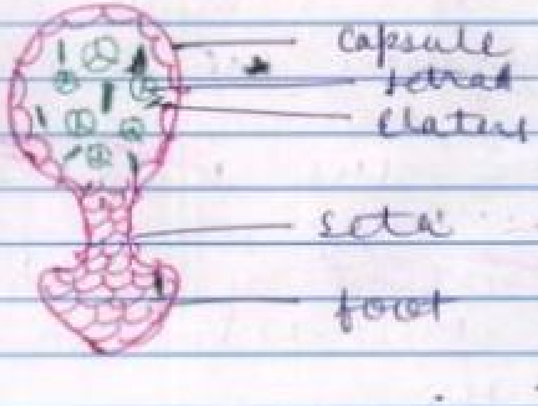
Paper Code

(4·) (4·)

Reproduction of Zargonia

Male and female gametophyte which are haploid produce male & female gamete which fuse and fertilize to form zygote which later forms Embryo which is also diploid as Zygote is diploid. This Embryo further ~~produces spores & these sp~~ form Sporophytic body which forms ~~spor~~ spores by the help of meosis and which further on germination forms male & female gametophyte.

The sporophyte of Zargonia contains foot, seta & Capsule.
Elaters are present in Zargonia
Elaters are sterile



Structure of Sporophyte of Zargonia

Paper Code

H) (H)
Bryophytes is very much useful. It has ecological as well as economic importance also.

Bryophytes are very much useful for the production of medicines.

Marchantia are used in the treatment of the tubercles.

Rose paste of Riccia is used for the the treatment of ring worms.

The humic acid which is secreated by the leat moss is used in the treatment of herpes virus caused disease.

From above examples of the some Bryophytes it is made clear that Bryophytes are very useful for Nature, environment and even for the welfare of humans. Bryophytes also helps in acceleration of Biodiversity as it is present in variety of habitats.

Paper Code

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(I.)

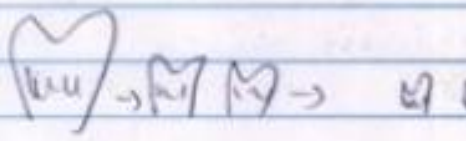
Ii) Vegetative reproduction in Bryophytes

show so vegetative reproduction

↳ Bryophytes reproduce in variety of ways.

(a) ~~Deaths and~~

(1.) Death and Decay method



Posterior part dies and apical region continue to grow and reproduce a new thallus.

eg:- Marchantia & Anthoceros.

(2.) Gemma cup formation

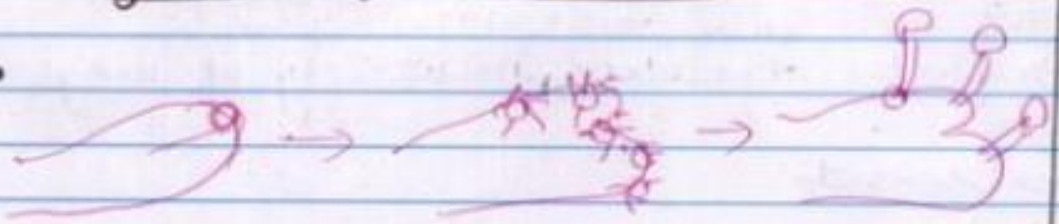
Gemma cup are present in the ante of the thallus of some bryophytes eg:- Marchantia etc.

Inside the gemma cup there is the presence of gemma. gemmae are connected with the stalk to the thallus.

gemmae ~~cup~~ has ~~Oil~~ cell, Rhizoidal cell & One celled stalk.

~~the gemmae a~~ gemmae give rise ~~release~~ to the ne thallus when dissemated by wind or by any method. ~~when they are removed from the~~

(3.) By tuber formation



Tubers are formed at the unfavorable condition. Protonema and new thallus is given rise through those tubers.

(4) By growing apices

In some Bryophytes the growing apices give rise to the new thallus.

(5) ~~By Adventitious~~

(5) By Adventitious Branching

In some Bryophytes new thallus also is formed by the adventitious branches.

(6.) By Primary protonema

In ~~Some~~ Mosses new thallus is also formed by primary protonema.

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