

U.G. 6th Semester Examination - 2022**BOTANY****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : BOT-H-DSE-P-03B****[PRACTICAL]****(Coastal Biology)*****Instructions to the Examiners.***

1. Specimen / Figure - A (any one) should be given alternately to the examinees. Specimen / Figure 'A' may be selected from all the available known mangrove species known. Specimens/ Figures should be provided alternately to the candidates.
2. For question no. 2 Figures 'B' and 'C' should be selected from all the available coastal zone monitoring instruments and the figures of instruments for coastal zone monitoring may be repeated in subsequent batches if the numbers of candidates are high. Specimens should be provided alternately to the candidates.
3. All preparations drawings with labelling must be endorsed by one of the examiners.

[Turn over]

4. A key to the supplied specimens (question-wise and candidate-wise) should be submitted to the convenor(s) / office of the Controller of Examinations (CoE) along with the answer scripts.
5. Candidates should submit duly signed Laboratory note books and other laboratory records such as permanent or semi-permanent slides prepared in their practical classes which will be assessed separately by the external examiner during end term examination.
6. Viva-Voce should be conducted jointly by more than one examiners. Equal time should be given to each candidate and candidates should be called on one at a time for viva voce. Question should cover different aspects of the course contents (both practical and theoretical) in which the candidates are being examined.
7. Marks and answer scripts are to be sent to the office of the CoE in separate sealed envelopes within a week from the date of completion of the examination.

725/Bot/PR

UG/6th Sem/BOT-H-CC-P-13/22

U.G. 6th Semester Examination - 2022

BOTANY

[HONOURS]

Course Code : BOT-H-CC-P-13

[PRACTICAL]

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate marks.

1. Perform a suitable statistical test and determine gene interaction using the given seed ratio. 7
 2. Identify with reasons. $1\frac{1}{2} + 1\frac{1}{2} = 3$
 3. Practical / Laboratory note book. 5
 4. Viva voce. 5
-

725/Bot/PR

UG/6th Sem/BOT-H-CC-P-13/22

U.G. 6th Semester Examination - 2022

BOTANY

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Course Code : BOT-H-CC-P-13

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4. Viva voce. 5

U.G. 6th Semester Examination - 2022

BOTANY

[HONOURS]

Course Code : BOT-H-CC-P-14

(Plant Molecular Biology and Biotechnology)

[PRACTICAL]

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate marks.

1. Write the principle of MS media preparation for plant tissue culture. What are essential micro- and macro nutrients for MS media preparation? Why pH in MS media is adjusted in media preparation?

2+4+1

2. Answer any **three** of the following questions:

1×3=3

- Define micropopagation.
- Mention the identifying features of synthetic seeds.
- Which of the technique is identified with vector: *Agrobacterium* mediated / gene gun mediated / liposome mediated in higher plants.
- What is the role of Bt gene in Bt crops?

[Turn over]

e) Write the difference between somatic and zygotic embryo.

3. Viva voce. 5
4. Practical Note book, specimen submission etc. 5

U.G. 6th Semester Examination - 2022

BOTANY
[HONOURS]

Course Code : BOT-H-CC-P-14

(Plant Molecular Biology and Biotechnology)

[PRACTICAL]

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate marks.

1. Write the principle of MS media preparation for plant tissue culture. What are essential micro- and macro nutrients for MS media preparation? Why pH in MS media is adjusted in media preparation?

2+4+1

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- Mention the identifying features of synthetic seeds.
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- What is the role of Bt gene in Bt crops?

[Turn over]

e) Write the difference between somatic and zygotic embryo.

3. Viva voce. 5
 4. Practical Note book, specimen submission etc. 5
-

U.G. 1st Semester Examination - 2019

BOTANY**[HONOURS]**

Course Code : BOT(H)CC-I-T

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.**

1. Answer any **five** of the following: 2×5=10
- a) What is zwitter ions form of amino acid?
 - b) What are chaperones? Give an example.
 - c) Give an example of a right-handed and a left-handed DNA.
 - d) Why Hn RNA is called 'DNA like RNA'?
 - e) Why ATP is called an **energy** currency molecule?
 - f) What do you mean by the term 'facilitated diffusion'?

[Turn over]

e) Write the difference between somatic and zygotic embryo.

3.

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g) Which particles of mitochondrion are responsible for electron transport chain? Give the full form of $\text{NADH}+\text{H}^+$.

h) What is MTOC? Give an example from plant cell.

2. Answer any two questions: $5 \times 2 = 10$

a) What do you mean by free energy? State the laws of thermodynamics. $2+3$

b) Define lipid. Write about the major classes of storage and structural lipids. $1+2+2$

c) Write with sketch diagram the fluid mosaic model of plasma membrane. 5

d) What is cytoskeleton? Briefly describe the structure of cytoskeleton components. $1+4$

3. Answer any two questions: $10 \times 2 = 20$

a) What are proteins? Give an account of the different levels of protein structure. Draw the pictorial flow diagram of targeting and insertion of proteins in the endoplasmic reticulum. $1+6+3$

b) What structural feature allows DNA to store genetic information? Write pointwise the structural features of A, B and Z type of DNA

224/Bot

(2)

with sketch diagram. Draw and label the clover leaf model of t RNA. $2+6+2$

c) Write the main cellular structures of an eukaryotic cell with diagram. Mention the origin of eukaryotic cell according to endosymbiotic theory. $6+4$

d) Define nucleus. Describe the nuclear envelope with special reference to nuclear pore complex with diagram. What is the importance of nucleolus? $1+7+2$

224/Bot

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U.G. 1st Semester Examination - 2019

BOTANY

(GENERIC ELECTIVE)

Course Code : BOT(H)GE-I-T

Full Marks : 40

Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

1. Answer any five of the following: 2×5=10

যে-কোনো পাঁচটি প্রশ্নের উত্তর দাও :

a) What is floridean starch?

ফ্লোরিডিয়ান স্টার্চ কাকে বলে?

b) Define Plasmid.

প্লাসমিড কাকে বলে?

c) Define hypha and mycelium.

হাইফা ও মাইসেলিয়াম কাকে বলে?

d) What is meant by Plasmogamy?

প্লাজমোগ্যামী কাকে বলে?

[Turn over]

- e) Name two Indian species of *Lycopodium*.
দাইকোপোডিয়ামের দুটি ভারতীয় প্রজাতির নাম লেখো।
- f) Define Elater. Write the function of elater.
ইলেটার কাকে বলে? উহার কার্য লেখ।
- g) Write the components of archegonium.
আর্কিগোনিয়ামের উপকরণগুলি লেখ।
- h) What is meant by Polyembryony?
বহুবীজজননতা কাকে বলে?

2. Answer any two questions: $5 \times 2 = 10$

যে-কোনো দুটি প্রশ্নের উত্তর দাও :

- a) Discuss the structure of TMV.
টোম্যাটো মোজাইক ভাইরাসের গঠন লেখ।
- b) Write the economic importance of lichen.
লাইকেনের অর্থনৈতিক গুরুত্ব আলোচনা কর।
- c) Discuss the structure of strobilus *Selaginella*.
Selaginella-র স্ট্রবিলাসের গঠন বর্ণনা কর।
- d) Mention the economic importance of algae as food and fodder.
বাদ্য ও পশুখাদ্য হিসাবে শৈবালের অর্থনৈতিক গুরুত্ব আলোচনা কর।

228/Bot

(2)

3. Answer any two questions: $10 \times 2 = 20$

যে-কোনো দুটি প্রশ্নের উত্তর দাও :

- a) Define Conjugation. Discuss the process in bacteria. $2+8=10$
কনজুগেশন কাকে বলে? ব্যাক্টেরিয়ার ক্ষেত্রে কনজুগেশন পদ্ধতির বর্ণনা দাও।
- b) What is meant by triphasic alternation of generation? Discuss the triphasic alternation of generation in respect to *Polysiphonia*. $2+8=10$

ত্রিশাযুক্ত অনুক্রম কাকে বলে? *Polysiphonia*-র জীবনচক্রের মাধ্যমে ব্যাখ্যা কর।

- c) Discuss different modes of reproduction in *Rhizopus*. 10
Rhizopus-এর বিভিন্ন ধরনের জনন পদ্ধতির বর্ণনা দাও।
- d) Write the economic importance of Gymnosperm. 10
জিনোস্পার্মের অর্থনৈতিক গুরুত্ব আলোচনা কর।

228/Bot

(3)

U.G. 3rd Semester Examination, 2019

BOTANY
[PROGRAMME]

Course Code : BOT(G)CC-03-T

Full Marks : 40

Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

(Plant Cell, Anatomy and Embryology)

1. Answer any five of the following: $2 \times 5 = 10$

যে-কোনো পাঁচটি প্রশ্নের উত্তর দাও :

a) What is sapwood?

অসারকাষ্ঠ কি?

b) Define Orthotropous Ovule and
Compylotropous Ovule.

উর্ধ্বমুখী এবং অশঙ্কুরাকৃতি ডিম্বক কাকে বলে?

c) What is the nature of endosperm in angiosperm
and when this formed?

গুপ্তবীজী উদ্ভিদের সস্যের প্রকৃতি কিরূপ এবং এটি কখন
তৈরী হয়?

[Turn Over]

- c) Schematically represent the major events of cell cycle. Write a brief description of nuclear membrane. 6+4

রেখাচিত্রসহ কোষচক্রের বিভিন্ন দশার বর্ণনা দাও। নিউক্লিয় পর্দার সংশ্লিষ্ট বিবরণ দাও।

- d) Enumerate different types of embryo-sac and their organization. Give a brief idea about endosperm type structure and function. 5+5

বিভিন্ন প্রকার অণুস্বলীর নাম লেখ এবং তাদের গঠন বর্ণনা কর। সস্যের প্রকারভেদ, গঠন এবং কার্য সম্পর্কে সংক্ষিপ্ত ধারণা দাও।

2019
BOTANY
[HONOURS]
Paper : I

Full Marks : 75

Time : 4 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP-A**(Algae)****(Marks: 25)**

1. Answer any **three** of the following: $1 \times 3 = 3$
- a) What is algin?
 - b) What is carboxysome?
 - c) Name one Indian species of *Anabaena*.
 - d) What is clump formation?
 - e) Name one alga used in production of biodiesel.
2. Answer any **three** of the following: $2 \times 3 = 6$
- a) What is heterocyst?
 - b) Distinguish between unilocular and pleurilocular sporangia.

[Turn over]

d) Enzymes are

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- c) What is biofertilizer?
d) What is Gaidukov phenomenon?
e) What is Macdonald Pfitzer's law?
3. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe sexual reproduction of *Coleochaete* with diagrams.
b) Describe the development of globule and nucule in *Chara* with suitable sketches.
4. Answer any **one** of the following: $10 \times 1 = 10$
- a) Describe the range of thallus structure in algae with sketches and examples. $6+2+2=10$
b) Describe post-fertilization changes of *Polysiphonia* with labelled sketches. 10

GROUP-B

(Fungi)

(Marks: 25)

5. Answer any **three** of the following: $1 \times 3 = 3$
- a) Name one species of plant parasitic fungus.
b) What is the main chemical component of fungal cell wall?
c) Name one Indian species of *Polyporus*.
d) What is kinetosome?
e) Name one species of edible mushroom.

184(Sc)

[2]

6. Answer any **three** of the following: $2 \times 3 = 6$

- a) What is Hartig net?
b) What is rhizomorph?
c) What is tetrapolar heterothallism?
d) What is chlamyospore?
e) What do you mean by haplobontic life cycle?
7. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe life cycle of *Saccharomyces* with figure.
b) Describe in brief the role of mycorrhiza in agriculture and forestry.
8. Answer any **one** of the following: $10 \times 1 = 10$
- a) Describe role of fungi in decomposition and bioremediation. 10
b) What is aflatoxin? Describe effects of different mycotoxins on human beings. $2+8=10$

GROUP-C

(Bryophyta)

(Marks: 25)

9. Answer any **three** of the following: $1 \times 3 = 3$
- a) Name one aquatic species of bryophyte.

184(Sc)

[3]

[Turn over]

- b) Why are bryophytes called amphibians of plant kingdom?
- c) What is perichaetium?
- d) What are peristome teeth?
- e) Where do you get pyrenoid in bryophyte?
10. Answer any **three** of the following: $2 \times 3 = 6$
- a) What is gemma?
- b) What is secondary protonema?
- c) What is the function of seta?
- d) What is calyptra?
- e) What is apophysis?
11. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe with labelled sketches the V.S. of mature sporophyte of *Anthoceros*. $3 + 3 = 6$
- b) Distinguish between antheridiophore and archegoniophore of *Marchantia* with sketches. 6
12. Answer any **one** of the following: $10 \times 1 = 10$
- a) Distinguish between sporophytes of *Riccia* and *Marchantia* with figures. $6 + 4 = 10$
- b) Describe algal and pteridophycean hypothesis of Bryophyta. $5 + 5 = 10$

2019
BOTANY
[HONOURS]
Paper : I

Full Marks : 75

Time : 4 Hours

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GROUP-A

(Algae)

(Marks: 25)

1. Answer any **three** of the following: 1×3=3
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 - d) What is clump formation?
 - e) Name one alga used in production of biodiesel.
2. Answer any **three** of the following: 2×3=6
- a) What is heterocyst?
 - b) Distinguish between unilocular and pleurilocular sporangia.

[Turn over]

e) Where do you get pyrenoid in bryophytes?

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- c) What is biofertilizer?
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 - b) Describe the development of globule and nucule in *Chara* with suitable sketches.
4. Answer any **one** of the following: $10 \times 1 = 10$
- a) Describe the range of thallus structure in algae with sketches and examples. $6 + 2 + 2 = 10$
 - b) Describe post-fertilization changes of *Polysiphonia* with labelled sketches. 10

GROUP-B
(Fungi)

(Marks: 25)

5. Answer any **three** of the following: $1 \times 3 = 3$
- a) Name one species of plant parasitic fungus.
 - b) What is the main chemical component of fungal cell wall?
 - c) Name one Indian species of *Polyporus*.
 - d) What is kinetosome?
 - e) Name one species of edible mushroom.

184(Sc)

[2]

6. Answer any **three** of the following: $2 \times 3 = 6$

- a) What is Hartig net?
- b) What is rhizomorph?
- c) What is tetrapolar heterothallism?
- d) What is chlamyospore?
- e) What do you mean by haplobontic life cycle?

7. Answer any **one** of the following: $6 \times 1 = 6$

- a) Describe life cycle of *Saccharomyces* with figure.
- b) Describe in brief the role of mycorrhiza in agriculture and forestry.

8. Answer any **one** of the following: $10 \times 1 = 10$

- a) Describe role of fungi in decomposition and bioremediation. 10
- b) What is aflatoxin? Describe effects of different mycotoxins on human beings.

$2 + 8 = 10$

GROUP-C
(Bryophyta)

(Marks: 25)

9. Answer any **three** of the following: $1 \times 3 = 3$

- a) Name one aquatic species of bryophyte.

184(Sc)

[3]

[Turn over]

- b) Why are bryophytes called amphibians of plant kingdom?
- c) What is perichaetium?
- d) What are peristome teeth?
- e) Where do you get pyrenoid in bryophyte?
10. Answer any **three** of the following: $2 \times 3 = 6$
- a) What is gemma?
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2019
BOTANY
[HONOURS]
Paper : I

Full Marks : 75

Time : 4 Hours

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(Algae)

(Marks: 25)

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 - e) Name one alga used in production of biodiesel.
2. Answer any **three** of the following: 2×3=6
- a) What is heterocyst?
 - b) Distinguish between unilocular and pleurilocular sporangia.

[Turn over]

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c) Wha
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- c) What is biofertilizer?
d) What is Gaidukov phenomenon?
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3. Answer any **one** of the following: $6 \times 1 = 6$
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4. Answer any **one** of the following: $10 \times 1 = 10$
a) Describe the range of thallus structure in algae with sketches and examples. $6 + 2 + 2 = 10$
b) Describe post-fertilization changes of *Polysiphonia* with labelled sketches. 10

GROUP-B

(Fungi)

(Marks: 25)

5. Answer any **three** of the following: $1 \times 3 = 3$
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c) Name one Indian species of *Polyporus*.
d) What is kinetosome?
e) Name one species of edible mushroom.

184(Sc)

[2]

6. Answer any **three** of the following: $2 \times 3 = 6$
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7. Answer any **one** of the following: $6 \times 1 = 6$
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a) Describe role of fungi in decomposition and bioremediation. 10
b) What is aflatoxin? Describe effects of different mycotoxins on human beings. $2 + 8 = 10$

GROUP-C

(Bryophyta)

(Marks: 25)

9. Answer any **three** of the following: $1 \times 3 = 3$
a) Name one aquatic species of bryophyte.

184(Sc)

[3]

[Turn over]

- b) Why are bryophytes called amphibians of plant kingdom?
- c) What is perichaetium?
- d) What are peristome teeth?
- e) Where do you get pyrenoid in bryophyte?
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12. Answer any **one** of the following: $10 \times 1 = 10$
- a) Distinguish between sporophytes of *Riccia* and *Marchantia* with figures. $6 + 4 = 10$
- b) Describe algal and pteridophycean hypothesis of Bryophyta. $5 + 5 = 10$

2019
BOTANY
[HONOURS]
Paper : I

Full Marks : 75

Time : 4 Hours

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GROUP-A

(Algae)

(Marks: 25)

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 - e) Name one alga used in production of biodiesel.
2. Answer any **three** of the following: 2×3=6
- a) What is heterocyst?
 - b) Distinguish between unilocular and pleurilocular sporangia.

[Turn over]

b) Why are bryophytes called amphibians of plant kingdom?

c)
d)

- c) What is biofertilizer?
d) What is Gaidukov phenomenon?
e) What is Macdonald Pfitzer's law?

10. Ans

a)
b)
c)
d)
e)

3. Answer any **one** of the following: $6 \times 1 = 6$
a) Describe sexual reproduction of *Coleochaete* with diagrams.
b) Describe the development of globule and nucule in *Chara* with suitable sketches.

11. Ans

a)
b)

4. Answer any **one** of the following: $10 \times 1 = 10$
a) Describe the range of thallus structure in algae with sketches and examples. $6 + 2 + 2 = 10$
b) Describe post-fertilization changes of *Polysiphonia* with labelled sketches. 10

12. A

a)
b)

GROUP-B

(Fungi)

(Marks: 25)

5. Answer any **three** of the following: $1 \times 3 = 3$
a) Name one species of plant parasitic fungus.
b) What is the main chemical component of fungal cell wall?
c) Name one Indian species of *Polyporus*.
d) What is kinetosome?
e) Name one species of edible mushroom.

184(Sc)

184(Sc)

[2]

6. Answer any **three** of the following: $2 \times 3 = 6$

- a) What is Hartig net?
b) What is rhizomorph?
c) What is tetrapolar heterothallism?
d) What is chlamydospore?
e) What do you mean by haplobontic life cycle?

7. Answer any **one** of the following: $6 \times 1 = 6$

- a) Describe life cycle of *Saccharomyces* with figure.
b) Describe in brief the role of mycorrhiza in agriculture and forestry.

8. Answer any **one** of the following: $10 \times 1 = 10$

- a) Describe role of fungi in decomposition and bioremediation. 10
b) What is aflatoxin? Describe effects of different mycotoxins on human beings. $2 + 8 = 10$

GROUP-C

(Bryophyta)

(Marks: 25)

9. Answer any **three** of the following: $1 \times 3 = 3$

- a) Name one aquatic species of bryophyte.

184(Sc)

[3]

[Turn over]

- b) Why are bryophytes called amphibians of plant kingdom?
- c) What is perichaetium?
- d) What are peristome teeth?
- e) Where do you get pyrenoid in bryophyte?
10. Answer any **three** of the following: $2 \times 3 = 6$
- a) What is gemma?
- b) What is secondary protonema?
- c) What is the function of seta?
- d) What is calyptra?
- e) What is apophysis?
11. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe with labelled sketches the V.S. of mature sporophyte of *Anthoceros*. $3 + 3 = 6$
- b) Distinguish between antheridiophore and archegoniophore of *Marchantia* with sketches. 6
12. Answer any **one** of the following: $10 \times 1 = 10$
- a) Distinguish between sporophytes of *Riccia* and *Marchantia* with figures. $6 + 4 = 10$
- b) Describe algal and pteridophycean hypothesis of Bryophyta. $5 + 5 = 10$

U.G. 2nd Semester Examination - 2019

BOTANY

[GENERIC ELECTIVE]

Course Code : BOTH/GE-T-02

Full Marks : 40

Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

1. Answer any **five** questions: 2×5=10
 যে-কোনো পাঁচটি প্রশ্নের উত্তর দাও :
- a) Mention any four adaptive features of halophytic plants.
 লবণাস্থ উদ্ভিদের যে কোনো চারটি অভিযোজন লেখ।
- b) What is principle of priority?
 “প্রিন্সিপল অফ প্রায়োরিটি” বলতে কি বোঝ?
- c) Give the full form of ICN.
 ICN-এর পুরো নাম লেখ।
- d) Define Labellum and Rostellum. 1+1
 ল্যাবেলাম ও রস্টেলাম কী?
- e) Give two distinguishing characters of Aggregate and Compound fruits.
 গুচ্ছিত ও যৌগিক ফলের দুটি পার্থক্য লেখ।

[Turn over]

- a) What is ge
b) What is se
c) What is th
d) What is cal
e) What is ap
Answer any one
Describe wi
mature spor
Distinguish
archegonic
sketches.
Answer any one
Distinguish
and Marcha
Describe algal
of Bryophyt

- f) Give the full form of VOC. How does it help to build up resistance of plants against herbivores? 1+1
VOC-এর পুরো নাম লেখ। ভূগর্ভস্থী পত্রের বিরুদ্ধে উদ্ভিদ প্রতিরোধে বৃদ্ধিতে এই-বৌগের যে কোনো দুটি ব্যবহার লেখ।
- g) Define Hotspots. Name the Indian Hotspots. 1+1
“হটস্পটস্” কাকে বলে? ভারতের “হটস্পটস্”গুলির নাম লেখ।
- h) Give example of two flowering plant families which can be identified by their inflorescence and by their fruits. 1+1
পুষ্পকিন্দাস ছারা ও ফলের ছারা সনাক্ত করা যায় এইরূপ দুটি উদ্ভিদ গোত্রের নাম লেখ।
2. Answer any two questions: 5×2=10
যে-কোনো দুটি প্রশ্নের উত্তর দাও :
- a) What is aestivation? Describe different types of aestivation with diagram. 1+4
পুষ্পপত্র কিন্দাস কাকে বলে? চিত্রসহ বিভিন্ন প্রকার পুষ্পপত্র কিন্দাস ব্যাখ্যা কর।
- b) Define Bio-geochemical cycles. Represent Nitrogen (N₂) Cycle with the help of word diagram. 1+4
জৈব ভূ-রাসায়নিক চক্র বলতে কি বোঝ? শব্দ ছকের মাধ্যমে নাইট্রোজেন (N₂) চক্রটি উপস্থাপন কর।

131/Bot/GE/II

(2)

- c) Write scientific name and family of a plant where gynobasic style is observed. Give the diagnostic characters of that plant family. 1+1+3
পর্ভমূলীয় পর্ভদণ্ড পাওয়া যায় এইরূপ একটি উদ্ভিদের বিজ্ঞাননামসহ নাম গোত্রসহ লেখ। ঐ গোত্রের সনাক্তকরণ বৈশিষ্ট্যগুলি উল্লেখ কর।
- d) Define Herbarium. Write the name of largest Herbarium of India. Mention the importance of Botanical Gardens in Study of Botany. 1+1+3
হাৰ্বেৰিয়াম কি? বৃহত্তম ভারতীয় হাৰ্বেৰিয়ামটির নাম লেখ। উদ্ভিদবিজ্ঞান পাঠে উদ্ভিদ উদ্যানের ভূমিকা উল্লেখ কর।
3. Answer any two questions: 10×2=20
যে-কোনো দুটি প্রশ্নের উত্তর দাও :
- a) What is food chain? Define Ecological Pyramids. Draw and describe different types of ecological pyramids. 1+1+8
বাদ্য শৃঙ্খল কাকে বলে? বাস্তুতাত্ত্বিক পিরামিডের সংজ্ঞা দাও। চিত্রসহ বিভিন্ন প্রকার বাস্তুতাত্ত্বিক পিরামিডের বর্ণনা দাও।
- b) Define plant geography. Describe different plant geographical areas of India as per D. Chatterjee (1962) with the help of a map. Name one endemic plant of India and its place of origin. 1+7+2

131/Bot/GE/II

(3)

[Turn over]

উদ্ভিদ ভূগোল কাকে বলে? ডি. চ্যাটার্জী (১৯৬২) বর্ণিত ভারতের বিভিন্ন উদ্ভিদ ভৌগোলিক অঞ্চলগুলির বর্ণনা দাও। ভারতের একটি এন্ডেমিক উদ্ভিদ ও তার উৎসস্থানের উল্লেখ কর।

- c) Define natural system of classification. What are "Cohort" and "Natural Order"? Schematically represent the Bentham and Hooker's system of classification. Mention its merits and demerits. 1+1+5+3

প্রাকৃতিক শ্রেণীবিন্যাস বলতে কি বোঝ? 'কোহর্ট' ও 'ন্যাচারাল অর্ডার' কি? 'বেঙ্হাম ও হুকারের' শ্রেণীবিন্যাস পদ্ধতি একটি ছকের মাধ্যমে দেখাও। এই শ্রেণীবিন্যাস পদ্ধতির গুণ ও ত্রুটিগুলি লেখ।

- d) What is Spikelet? Draw and describe Spikelet. Name the plant family where it is found. Describe the diagnostic features of that family. Give scientific names of two edible plants of that family. 1+2+1+4+2

অনুমঞ্জরী কি? চিত্রসহ বর্ণনা কর। এই ধরনের পুষ্পবিন্যাস কোন্ গোত্রে দেখা যায়? ঐ গোত্রের সনাক্তকরণ বৈশিষ্ট্যগুলি লেখ। ঐ গোত্রের দুটি খাদ্যপোষোগী উদ্ভিদের বিজ্ঞানসম্মত নাম লেখ।

U.G. 1st Semester Examination - 2018**BOTANY
(HONOURS)****Course Code : BOTH/CC-T-I**

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.**1. Answer any **five** of the following: 2×5=10

- a) What is the main difference between electrovalent and covalent bonds?
- b) What is meant by the term 'buffer solution'?
- c) A double-stranded DNA molecule contains 560 nucleotides. How many complete turns would be found in this double helix?
- d) An organism has a G+C content of 64% in its DNA. What are the percentages of A, T, G and C?
- e) Mention the name of any two essential fatty acids.

[Turn over]

- f) Why is the linkage between two nucleotides of a nucleic acid called phosphodiester bond?
- g) Which are the most important chemical components considered as 'fluid' part and 'mosaic' part of the fluid mosaic model of membrane?
- h) What is 'prosthetic group'?

2. Answer any two of the following: $5 \times 2 = 10$

- a) What are biomolecules? Write a short account of the carbohydrates giving their classification. $1+4$
- b) Diagrammatically mention the major check points of the cell cycle. Describe the role of protein Kinase in the regulation of cell cycle. $2+3$
- c) Describe the gross structure and chemical composition of the plant cell wall.
- d) What are ribosomes? Mention the different types of RNA. Briefly describe the structure of tRNA. $1+2+2$

3. Answer any two of the following: $10 \times 2 = 20$

- a) Diagrammatically represent the various stages of meiosis and point out the distinctive features of the process. Mention the significance of this process in the life cycle of the plant. $4+4+2$

83/Bot/H/1

(2)

- b) Describe the ultrastructure with sketches of the chloroplast. What are the similarities and differences between chloroplasts and mitochondria? $4+3+3$

- c) Describe the basic structure of chromatin with suitable sketches. What is the role of histones in this structures? $4+3+3$

- d) What is K_m ? What is the unit of K_m ? Write about the 'Induce-fit' theory of enzyme action. Write competitive inhibition of enzyme action with example. $1+1+4+4$

83/Bot/H/1

(3)

2019
BOTANY
[HONOURS]
Paper : IV

Full Marks : 75

Time : 4 Hours

*The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in
their own words as far as practicable.*

Answer all the questions.

(Pteridophytes)

[Marks : 25]

1. Answer any **three** of the following: 1×3=3
 - a) Name one halophytic fern.
 - b) What is the morphological nature of trabeculae in *Selaginella*?
 - c) What is a sorus?
 - d) Define telome.
 - e) Name two edible pteridophytes.

2. Answer any **three** of the following: 2×3=6
 - a) What is a synangium? Give an example.
 - b) To which genus is *Rhynia major* transferred, why and by whom?
 - c) Distinguish apospory and apogamy.
 - d) Why is *Azolla* used as a biofertilizer in agriculture?

[Turn over]

c) Mention two characteristic features of the class sphenopsida.

3. Answer any **one** of the following: $6 \times 1 = 6$

a) Describe the variations in strobiler structures in the reconstructed plant *Calamites* with suitable diagrams.

b) Explain with the help of the telome theory the origin of fertile structures in Psilophyta and Sphenophyta with relevant diagrams.

4. Answer any **one** of the following: $10 \times 1 = 10$

a) Describe the fertile spike of *Ophioglossum* with labelled diagrams and comment on its morphological nature. Mention the fern characters absent in the genus. $4 + 4 + 2 = 10$

b) Describe different types of stele encountered in the species of *Lycopodium* with necessary diagrams. What is incipient hetrospory? Give one example. $8 + 1 + 1 = 10$

(Progymnosperms & Gymnosperms)

[Marks : 25]

5. Answer any **three** of the following: $1 \times 3 = 3$

a) Name two species of *Gnetum* with contrasting habit.

b) What is 'Chilgoza Pine'?

c) Name the native home of *Ginkgo biloba*.

d) Who reconstructed *Williamsonia sewardiana* and in which year?

187(Sc)

[2]

e) Where do you get plicate mesophyll?

6. Answer any **three** of the following: $2 \times 3 = 6$

a) Name the active compound found in *Ginkgo* and *Taxus*.

b) What is the basis of Pragymnosperm concept?

c) Mention two fern characters of *Cycas*.

d) What are the advantages of seed habit?

e) Distinguish manoxylic and pycroxylic wood with examples.

7. Answer any **one** of the following: $6 \times 1 = 6$

a) Describe embryogeny of *Pinus* with suitable diagrams. Distinguish ovuliferous scale and interseminal scale. $4 + 2 = 6$

b) Describe female gametophyte of *Cycas* and *Gnetum*. Which do you think is advanced and why?

8. Answer any **one** of the following: $10 \times 1 = 10$

a) Name the different organ genere of the reconstructed plant *Williamsonia*. Describe its male and female fructifications. Mention its age and area from where it was discovered. $2 + 3 + 3 + 1 + 1 = 10$

b) Write the Indian distribution of different species of *Cycas*, *Pinus*, *Ginkgo* and *Gnetum*. $2 \frac{1}{2} \times 4 = 10$

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187(Sc)

(Paleobotany and Palynology)

[Marks : 25]

9. Answer any **three** of the following: $1 \times 3 = 3$
- What is the mode for preservation of coal ball?
 - What are ichnofossils? Cite one example.
 - In which type of rock fossils are mainly preserved?
 - What is 'hay fever'?
 - Name the index fossil of Middle Gondwana.
10. Answer any **three** of the following: $2 \times 3 = 6$
- Distinguish microfossil and megafossil.
 - Write the importances of amber and coal.
 - Mention on which surface, distal or proximal, a trilete aperture will be present.
 - Draw a tetracolporate pollen grain.
 - What is kerogen?
11. Answer any **one** of the following: $6 \times 1 = 6$
- Discuss the conditions favourable for fossilizations.
 - Briefly state the NPC classification. Give the NPC number of a tricolpate pollen. $5+1$
12. Answer any **one** of the following: $10 \times 1 = 10$
- Describe the C^{14} method of dating. 10
 - Discuss the importances of melissopalynology and forensic palynology. $5+5$

187(Sc)

[4]

2019
BOTANY
[HONOURS]
Paper : IV

Full Marks : 75

Time : 4 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

(Pteridophytes)

[Marks : 25]

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 - d) Define telome.
 - e) Name two edible pteridophytes.

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 - b) To which genus is *Rhynia major* transferred, why and by whom?
 - c) Distinguish apospory and apogamy.
 - d) Why is *Azolla* used as a biofertilizer in agriculture?

[Turn over]

(Paleobotany and Palynology)

[Marks : 25]

Answer any three of the following: $1 \times 3 = 3$

c) Mention two characteristic features of the class sphenopsida.

3. Answer any one of the following: $6 \times 1 = 6$

a) Describe the variations in strobiliferous structures in the reconstructed plant *Calamites* with suitable diagrams.

b) Explain with the help of the telome theory the origin of fertile structures in Psilophyta and Sphenophyta with relevant diagrams.

4. Answer any one of the following: $10 \times 1 = 10$

a) Describe the fertile spike of *Ophioglossum* with labelled diagrams and comment on its morphological nature. Mention the fern characters absent in the genus. $4 + 4 + 2 = 10$

b) Describe different types of stele encountered in the species of *Lycopodium* with necessary diagrams. What is incipient heterospory? Give one example. $8 + 1 + 1 = 10$

(Progymnosperms & Gymnosperms)

[Marks : 25]

5. Answer any three of the following: $1 \times 3 = 3$

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b) What is 'Chilgoza Pine'?

c) Name the native home of *Ginkgo biloba*.

d) Who reconstructed *Williamsonia sewardiana* and in which year?

187(Sc)

[2]

c) Where do you get plicate mesophyll?

6. Answer any three of the following: $2 \times 3 = 6$

a) Name the active compound found in *Ginkgo* and *Taxus*.

b) What is the basis of Pragymnosperm concept?

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e) Distinguish manoxylic and pycnoxylic wood with examples.

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b) Describe female gametophyte of *Cycas* and *Gnetum*. Which do you think is advanced and why?

8. Answer any one of the following: $10 \times 1 = 10$

a) Name the different organ genera of the reconstructed plant *Williamsonia*. Describe its male and female fructifications. Mention its age and area from where it was discovered. $2 + 3 + 3 + 1 + 1 = 10$

b) Write the Indian distribution of different species of *Cycas*, *Pinus*, *Ginkgo* and *Gnetum*. $2 \frac{1}{2} \times 4 = 10$

187(Sc)

[3]

[Turn over]

[Turn over]

(Paleobotany and Palynology)

[Marks : 25]

9. Answer any **three** of the following: $1 \times 3 = 3$

- a) What is the mode for preservation of coal ball?
- b) What are ichnofossils? Cite one example.
- c) In which type of rock fossils are mainly preserved?
- d) What is 'hay fever'?
- e) Name the index fossil of Middle Gondwana.

10. Answer any **three** of the following: $2 \times 3 = 6$

- a) Distinguish microfossil and megafossil.
- b) Write the importances of amber and coal.
- c) Mention on which surface, distal or proximal, a trilete aperture will be present.
- d) Draw a tetracolporate pollen grain.
- e) What is kerogen?

11. Answer any **one** of the following: $6 \times 1 = 6$

- a) Discuss the conditions favourable for fossilizations.
- b) Briefly state the NPC classification. Give the NPC number of a tricolpate pollen. $5+1$

12. Answer any **one** of the following: $10 \times 1 = 10$

- a) Describe the C^{14} method of dating. 10
- b) Discuss the importances of melissopalynology and forensic palynology. $5+5$

U.G. 2nd Semester Examination - 2019

BOTANY**[GENERIC ELECTIVE]**

Course Code : BOTH/GE-T-02

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.**1. Answer any **five** questions: 2×5=10

যে-কোনো পাঁচটি প্রশ্নের উত্তর দাও :

a) Mention any four adaptive features of halophytic plants.

লবণাস্থ উদ্ভিদের যে কোনো চারটি অভিযোজন লেখ।

b) What is principle of priority?

“প্রিন্সিপল অফ প্রায়োরিটি” বলতে কি বোঝ?

c) Give the full form of ICN.

ICN-এর পুরো নাম লেখ।

d) Define Labellum and Rostellum. 1+1

ল্যাবেলাম ও রস্টেলাম কী?

e) Give two distinguishing characters of Aggregate and Compound fruits.

গুচ্ছিত ও যৌগিক ফলের দুটি পার্থক্য লেখ।

- c) Write scientific name and family of a plant where gynobasic style is observed. Give the diagnostic characters of that plant family.

1+1+3

গর্ভমূলীয় গর্ভদণ্ড পাওয়া যায় এইরূপ একটি উদ্ভিদের বিজ্ঞানসম্মত নাম গোত্রসহ লেখ। ঐ গোত্রের সনাক্তকরণ বৈশিষ্ট্যগুলি উল্লেখ কর।

- d) Define Herbarium. Write the name of largest Herbarium of India. Mention the importance of Botanical Gardens in Study of Botany.

1+1+3

হার্বেরিয়াম কি? বৃহত্তম ভারতীয় হার্বেরিয়ামটির নাম লেখ। উদ্ভিদবিজ্ঞান পাঠে উদ্ভিদ উদ্যানের ভূমিকা উল্লেখ কর।

3. Answer any two questions: $10 \times 2 = 20$

যে-কোনো দুটি প্রশ্নের উত্তর দাও :

- a) What is food chain? Define Ecological Pyramids. Draw and describe different types of ecological pyramids. $1+1+8$

খাদ্য শৃঙ্খল কাকে বলে? বাস্তুতাত্ত্বিক পিরামিডের সংজ্ঞা দাও। চিত্রসহ বিভিন্ন প্রকার বাস্তুতাত্ত্বিক পিরামিডের বর্ণনা দাও।

- b) Define plant geography. Describe different plant geographical areas of India as per D. Chatterjee (1962) with the help of a map. Name one endemic plant of India and its place of origin. $1+7+2$

উদ্ভিদ ভূগোল কাকে বলে? ডি. চ্যাটার্জী (১৯৬২) বর্ণিত ভারতের বিভিন্ন উদ্ভিদ ভৌগোলিক অঞ্চলগুলির বর্ণনা দাও। ভারতের একটি এন্ডেমিক উদ্ভিদ ও তার উৎসস্থানের উল্লেখ কর।

- c) Define natural system of classification. What are "Cohort" and "Natural Order"? Schematically represent the Bentham and Hooker's system of classification. Mention its merits and demerits.

1+1+5+3

প্রাকৃতিক শ্রেণীবিন্যাস বলতে কি বোঝ? 'কোহর্ট' ও 'ন্যাচারাল অর্ডার' কি? 'বেঙ্হাম ও হুকারের' শ্রেণীবিন্যাস পদ্ধতি একটি ছকের মাধ্যমে দেখাও। এই শ্রেণীবিন্যাস পদ্ধতির গুণ ও ত্রুটিগুলি লেখ।

- d) What is Spikelet? Draw and describe Spikelet. Name the plant family where it is found. Describe the diagnostic features of that family. Give scientific names of two edible plants of that family.

1+2+1+4+2

অনুমঞ্জরী কি? চিত্রসহ বর্ণনা কর। এই ধরনের পুষ্পবিন্যাস কোন্ গোত্রে দেখা যায়? ঐ গোত্রের সনাক্তকরণ বৈশিষ্ট্যগুলি লেখ। ঐ গোত্রের দুটি খাদ্যপোষ্যোগী উদ্ভিদের বিজ্ঞানসম্মত নাম লেখ।

187(Sc)

UG-II/Bot.-IV(H)/19

2019
BOTANY
[HONOURS]
Paper : IV

Full Marks : 75

Time : 4 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

(Pteridophytes)

[Marks : 25]

1. Answer any **three** of the following: 1×3=3
 - a) Name one halophytic fern.
 - b) What is the morphological nature of trabeculae in *Selaginella*?
 - c) What is a sorus?
 - d) Define telome.
 - e) Name two edible pteridophytes.

2. Answer any **three** of the following: 2×3=6
 - a) What is a synangium? Give an example.
 - b) To which genus is *Rhynia major* transferred, why and by whom?
 - c) Distinguish apospory and apogamy.
 - d) Why is *Azolla* used as a biofertilizer in agriculture?

[Turn over]

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ম দেখা। এই ৩
কি।
পিকেট? Draw
plant family
diagnostic f
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চিত্র সহ বর্ণনা কর
কি যার। এই পোটে
ক দুটি কালকোটে

(4)

- c) Mention two characteristic features of the class sphenopsida.
3. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe the variations in strobiler structures in the reconstructed plant *Calamites* with suitable diagrams.
- b) Explain with the help of the telome theory the origin of fertile structures in Psilophyta and Sphenophyta with relevant diagrams.
4. Answer any **one** of the following: $10 \times 1 = 10$
- a) Describe the fertile spike of *Ophioglossum* with labelled diagrams and comment on its morphological nature. Mention the fern characters absent in the genus. $4+4+2=10$
- b) Describe different types of stele encountered in the species of *Lycopodium* with necessary diagrams. What is incipient hetrospory? Give one example. $8+1+1=10$

(Progymnosperms & Gymnosperms)

[Marks : 25]

5. Answer any **three** of the following: $1 \times 3 = 3$
- a) Name two species of *Gnetum* with contrasting habit.
- b) What is 'Chilgoza Pine'?
- c) Name the native home of *Ginkgo biloba*.
- d) Who reconstructed *Williamsonia seawardiana* and in which year?

187(Sc)

[2]

- c) Where do you get plicate mesophyll?
6. Answer any **three** of the following: $2 \times 3 = 6$
- a) Name the active compound found in *Ginkgo* and *Taxus*.
- b) What is the basis of Pragymnosperm concept?
- c) Mention two fern characters of *Cycas*.
- d) What are the advantages of seed habit?
- e) Distinguish manoxylic and pycroxylic wood with examples.
7. Answer any **one** of the following: $6 \times 1 = 6$
- a) Describe embryogeny of *Pinus* with suitable diagrams. Distinguish ovuliferous scale and interseminal scale. $4+2=6$
- b) Describe female gametophyte of *Cycas* and *Gnetum*. Which do you think is advanced and why?
8. Answer any **one** of the following: $10 \times 1 = 10$
- a) Name the different organ genere of the reconstructed plant *Williamsonia*. Describe its male and female fructifications. Mention its age and area from where it was discovered. $2+3+3+1+1=10$
- b) Write the Indian distribution of different species of *Cycas*, *Pinus*, *Ginkgo* and *Gnetum*. $2 \frac{1}{2} \times 4 = 10$

187(Sc)

[3]

[Turn over]

(Paleobotany and Palynology)

[Marks : 25]

9. Answer any **three** of the following: $1 \times 3 = 3$
- a) What is the mode for preservation of coal ball?
 - b) What are ichnofossils? Cite one example.
 - c) In which type of rock fossils are mainly preserved?
 - d) What is 'hay fever'?
 - e) Name the index fossil of Middle Gondwana.
10. Answer any **three** of the following: $2 \times 3 = 6$
- a) Distinguish microfossil and megafossil.
 - b) Write the importances of amber and coal.
 - c) Mention on which surface, distal or proximal, a trilete aperture will be present.
 - d) Draw a tetracolporate pollen grain.
 - e) What is kerogen?
11. Answer any **one** of the following: $6 \times 1 = 6$
- a) Discuss the conditions favourable for fossilizations.
 - b) Briefly state the NPC classification. Give the NPC number of a tricolpate pollen. $5+1$
12. Answer any **one** of the following: $10 \times 1 = 10$
- a) Describe the C^{14} method of dating. 10
 - b) Discuss the importances of melissopalynology and forensic palynology. $5+5$

U.G. 1st Semester Examination - 2019**BOTANY**
[HONOURS]**Course Code : BOT(H)CC-I-T**

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.**

1. Answer any **five** of the following: $2 \times 5 = 10$
- What is zwitter ions form of amino acid?
 - What are chaperones? Give an example.
 - Give an example of a right-handed and a left-handed DNA.
 - Why Hn RNA is called 'DNA like RNA'?
 - Why ATP is called an energy currency molecule?
 - What do you mean by the term 'facilitated diffusion'?

[Turn over]

(Botany and Palynology)

[Marks : 25]

of the following: $1 \times 3 = 3$

mode for preservation of coal ball?

g) Which particles of mitochondrion are responsible for electron transport chain? Give the full form of $\text{NADH} + \text{H}^+$.

h) What is MTOC? Give an example from plant cell.

2. Answer any two questions: $5 \times 2 = 10$

a) What do you mean by free energy? State the laws of thermodynamics. $2+3$

b) Define lipid. Write about the major classes of storage and structural lipids. $1+2+2$

c) Write with sketch diagram the fluid mosaic model of plasma membrane. 5

d) What is cytoskeleton? Briefly describe the structure of cytoskeleton components. $1+4$

3. Answer any two questions: $10 \times 2 = 20$

a) What are proteins? Give an account of the different levels of protein structure. Draw the pictorial flow diagram of targeting and insertion of proteins in the endoplasmic reticulum. $1+6+3$

b) What structural feature allows DNA to store genetic information? Write pointwise the structural features of A, B and Z type of DNA

24/Bot

(2)

with sketch diagram
leaf model of tRNA

c) Write the main components of eukaryotic cell with a diagram of eukaryotic cell and state the cell theory.

d) Define nucleus. Describe its structure with special reference to nucleolus with diagram. What is the function of nucleolus?

224/Bot

(3)