

2018**BOTANY****Semester-I Examination (DODL)****Paper : BOHCT1.1****(Biology & Diversity of Virus, Bacteria & Fungi)**

Full Marks : 60

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.***GROUP-A****(Biology & Diversity of Virus)****(Marks : 20)**

1. Answer any **five** of the following: 5×2=10
 - a) Name one single stranded RNA-containing plant virus. Name the disease with infected plant.
 - b) Distinguish between viroids and virusoids.
 - c) Mention the role of cro gene.
 - d) What is ELISA? Mention its significance.

- e) What is HeLa cell line?
- f) What is Cross protection in virus management?
- g) What is prion?

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

a) What is virion? Describe regulatory mechanism of virus replication. $2+8$

b) Name major vectors of plant virus transmission mentioning the virus group. Describe the molecular basis of virus movement in cell.

$5+5$

GROUP-B

(Biology & Diversity of Bacteria)

(Marks: 20)

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

a) What are paralogs and orthologs?

b) What is Hfr strain?

c) What is immunoglobulin?

d) Define hypersensitivity and mention its types.

e) What is DNA Vaccine?

f) Mention the functional activity of penicillin and lysozyme in cell wall of bacteria.

6(D)

- g) Name two microbial type culture collection centre in India.
4. Answer any **one** of the following: $1 \times 10 = 10$
- a) Describe the cell wall composition of gram negative bacteria with diagram. Mention different types of bacterial groups on the basis of nutrition. $5+5$
- b) What is hapten? Describe the structural features of any one type of immunoglobulin with schematic diagram. $2+8$

GROUP-C

(Biology & Diversity of Fungi)

(Marks: 20)

5. Answer any **five** of the following: $5 \times 2 = 10$
- a) What are lomasomes? Mention their function.
- b) Differentiate paragynous and amphigynous type antheridia.
- c) What is dolipore septum?
- d) Define heterocious rust.
- e) What is buller phenomenon?
- f) Define holocarpic and eucarpic thallus.
- g) What is meant by parasexuality?

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

a) What is sclerotia? Describe in details the process of Ascospore formation in Ascomycetes. $2+8$

b) Describe the biogenesis of the fungal cell wall. Illustrate the evolution of conidia among Zygomycota members. $5+5$

2018**BOTANY****Semester-I Examination (DODL)****Course : BOHCT-1.2****(Biology & Diversity of Algae, Bryophytes & Pteridophytes)**

Full Marks : 60

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****GROUP-A****(Biology & Diversity of Algae)****(Marks : 20)**

1. Answer the following in brief (any **five**): $5 \times 2 = 10$
 - a) What is ocelli? Mention its function.
 - b) Mention two diagnostic features of Bacillariophyceae.
 - c) What are carrageenans? Cite example.
 - d) Mention three different patterns of golgi associations in red algae.

[Turn over]

- e) What is hypobradytely? Give reasons for it.
- f) What is Cyanelle? Name two algal groups with two membranes of CER surrounding the chloroplast.
- g) What is meant by red tide?
2. Answer any **one** of the following: $1 \times 10 = 10$
- a) What evidence support endosymbiotic theory? Write an explanatory note on endosymbiotic theory of chloroplast evolution and algal origin. Validate the separation of the Prymnesiophytes from heterokontophytes. $2+6+2$
- b) Why phytoplankton ecology is important? Mention the types of phytoplankton based on their size. Write short note on evolutionary trends in green algal lineages. $2+2+6$

GROUP-B

(Biology & Diversity of Bryophytes)

(Marks: 20)

3. Answer the following in brief (any **five**): $5 \times 2 = 10$
- a) What are the unique features of Marchantiales?
- b) Name two subtypes of anthrodontous peristome with their diagnostic features.

- c) What is amphigastria?
 - d) How does the sporophyte of the genus *Notothylas* differ from other hornworts?
 - e) What are leptoids and hydroids?
 - f) Name two bryophytes used as medicine.
 - g) Write the full form of IUCN and GSPC.
4. Answer any **one** of the following: $1 \times 10 = 10$
- a) Give a brief account of evolutionary significance and phylogenetic interrelationships in three lineages of bryophytes. Mention the salient features of moss sporophyte. $4+3+3$
 - b) How are bryophytes ecologically important? Write a short note on restoration ecology. $6+4$

GROUP-C

(Biology & Diversity of Pteridophytes)

(Marks: 20)

5. Answer the following in brief (any **five**): $5 \times 2 = 10$
- a) What are the difference between fern ally and true fern?
 - b) Name two pteridophytes with secondary thickening and two with vessels.

- c) What is meant by megaphylls?
- d) Mention the peculiar features of Ophioglossales.
- e) Name one biciliate and two pluriciliate pteridophytes.
- f) Name four endemic ferns of India with their RET category.
- g) Mention the classes of pteridophytes according to classification of Smith et al. (2006).

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

- a) Describe the patterns of spore germination in pteridophytes with suitable diagram. What is leptosporangiate sporangia? Which fern family gets intermediate position between eusporangiate and leptosporangiate ferns? How does leptosporangiate ferns evolved from eusporangiate one? $6+1+1+2$

- b) "Antheridogen is a pheromone"— Justify. Mention its chemical nature. Write a short note on conservation strategies of pteridophytic species and mention the future approach of conservation. $2+2+6$

2018**BOTANY****Semester-I Examination (DODL)****Course : BOHCT-1.3****(Biology & Diversity of Gymnosperms, Taxonomy of
Angiosperms & Biosystematics)**

Full Marks : 60

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****GROUP-A****(Biology & Diversity of Gymnosperms)****(Marks : 20)**

1. Answer the following in brief (any **five**): $5 \times 2 = 10$
 - a) Mention xerophytic features of Ephedra.
 - b) Define form and organ genera.
 - c) Name the root and seed genera of Lyginopteridaceae.

[Turn over]

- d) Write down the distinctive characters of Pentoxylaceae.
- e) What is haplocheilic type of stomata?
- f) State the medicinal importance of *Ephedra*.
- g) What is shower of sulphur?
2. Answer any **one** of the following: $1 \times 10 = 10$
- a) Give a brief account on general characters and its affinities of Glossopteridaceae and Pentoxylaceae. $5+5$
- b) Write down the affinities of Bennettiales with angiosperm. Mention the angiospermic characters of *Gnetum*. $5+5$

GROUP-B

(Taxonomy of Angiosperms & Biosystematics)

(Marks: 40)

3. Answer any **ten** of the following: $10 \times 1 = 10$
- a) Mention two diagnostic features of the order Nepenthales.
- b) Name two betalain containing plant families.
- c) What is meant by Schizoendemism?
- d) Mention the role of PIII subtype sieve tube plastids in the division of order Caryophyllales.

- e) What is heterobathmy?
- f) Mention two demerits of Cronquist system of classification.
- g) Name two chloroplast gene commonly used as molecular marker.
- h) What is meant by Chapter F?
- i) Write the full form of ICN and ISPN.
- j) What is Phyllodia?
- k) What is TROPICOS?
- l) What is later homonym?
- m) Name two largest Herbaria of the world.
- n) Give two examples of general taxonomic indices.

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

- a) What is meant by ANITA grade?
- b) Enumerate two major changes of Melbourne code.
- c) Define chemotaxonomy with suitable example.
- d) Distinguish anagenesis from cladogenesis.
- e) What is invasive species? Give two examples.
- f) What are the differences between flora and manual?
- g) Mention the two theories of Endemism.

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

a) Briefly describe the diagnostic features of Podostemales. Discuss the interrelationship and evolutionary trends of Poaceae in the light of PACCAD and BEP clade. $5+5$

b) How cladistics system of classification differ from phenetic system of classification? Compare between monophyly, paraphyly and polyphyly. Write a short note on homoplasy. $6+3+1$

c) Write short notes on any **two** of the following: $2 \times 5 = 10$

- i) DNA barcoding
 - ii) Biosystematic categories
 - iii) Typification
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2018**BOTANY****Semester-I Examination (DODL)****Course : BOHCT-1.4****(Cytology, Cytogenetics and Genetics)**

Full Marks : 60

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 **ten** of the following: $1 \times 10 = 10$
- What is Shelterin?
 - Name the amino acid which is not present in the histone protein.
 - What is meant by gaudens-velans complex?
 - The chromosome number of cultivated wheat is $2n=6x=42$. Mention its basic and gametic chromosome number.
 - Name two diseases related to aneuploidy.
 - What is Balbiani ring?

[Turn Over]

- g) What is meant by maternal effect?
- h) Give two examples of intercalating agent used as chemical mutagens.
- i) Define genetic imprinting.
- j) What is F'?
- k) What is the conserved sequence of TATA box?
- l) Mention the role of caspase enzyme in apoptosis.
- m) Name two common drug used in chemotherapy.
- n) Give two examples of Type II Restriction endonucleases.

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

- a) What is C-value paradox?
- b) Mention salient features of criss-cross inheritance.
- c) What is meant by bottle-neck effect?
- d) Calculate the frequency of L^M and L^N alleles from the given data:

Blood Type	No. of individuals
M	1787
MN	3039
N	1303

- e) Mention the function of different subunits of RNA polymerase.
- f) What are the differences between apoptosis and necrosis?
- g) What is Ac-Ds element?

3. Answer any **four** of the following: $10 \times 4 = 40$

a) What is meant by frame shift mutation? How does base analogues induce mutation? Enumerate the steps of nucleotide excision repair with suitable diagram. $2+3+5$

b) Why DNA replication is essential for eukaryotic cell? Mention different replicating enzymes with their specific role. Explain the process of translation in prokaryotes.

$1+4+5$

c) What will happen when *E. coli* cells are grown in a medium containing both glucose and lactose? Mention the role of catabolite activator protein (CAP) in *lac* operon. Briefly describe the process of regulation of gene expression in Eukaryotes with suitable example.

$3+3+4$

d) Name the tumor suppressor gene that is linked with Li Fraumeni syndrome. Mention the role of p⁵³ and E₂F in cell cycle regulation. How do proto-oncogenes can be converted to oncogenes? What is transfection test?

1+5+2+2

e) What is segmental allopolyploid? Mention the role of allopolyploids in evolution. Describe how nucleosome helps in packaging the DNA molecule into metaphase chromosome.

2+4+4

f) Briefly describe the sex determination of human and *Melandrium* with suitable diagrams. How does X chromosome inactivation of Mammals take place.

6+4