(4)

This question paper contains 4 printed pages. 11/5/18

Your Roll No. .....

Sl. No. of Ques. Paper	: **6472**	**HC**
Unique Paper Code	: **32161401**	
Name of Paper	: **Molecular Biology**	
Name of Course	: **B.Sc. (Hons.) Botany**	
Semester	: **IV**	
Duration	: **3 hours**	
Maximum Marks	: **75**	

(Write your Roll No. on the top immediately on receipt of this question paper.)

*Attempt **five** questions in all.*
Question No. 1 is compulsory.

All parts of a question must be attempted together.
Draw well-labelled diagrams wherever necessary.

1. (a) Define any *five* of the following terms:

   (i) Primer

   (ii) Repressor

   (iii) Consensus sequence

   (iv) Spliceosome

   (v) Intron

   (vi) Transformation. 1×5=5

   (b) Expand the following terms (any *five*):

   (i) TBP

   (ii) BRE

P. T. O.

(iii) UTR

(iv) *sn*RNA

(v) INR

(vi) CAP 1×5=5

(c) List the most significant contribution of the following scientists (any *five*):

(i) J.D. Watson

(ii) John Cairns

(iii) Francis Crick

(iv) Andrew Fire and Craig Mello

(v) Robert Holley

(vi) Marshall Nirenberg. 1×5=5

(d) For the sequence of single stranded DNA provided:

5′ –ATTGCCAGATCATCCCAATAGAT-3′

(i) Write the sequence of complementary strand.

(ii) Write the sequence of the RNA transcribed from the template strand, marking its 5′ and 3′ ends. 2

(e) List any *two* unusual bases of *t*RNA. 2

2. Differentiate between the following terms (any *four*, tabulate the comparison):

(a) Nucleoside and Nucleotide

(b) Splicing in Group I intron and Splicing in Group II intron

(c) DNA polymerase I and DNA Polymerase III

(d) Constitutive and Facultative Heterochromatin

(e) Positive gene regulation and Negative gene regulation

(f) Polycistronic and Monocistronic *m*RNAs.

3.5×4=14

3. Write short notes on any *four* of the following:

(a) Ribozymes

(b) Charging of *t*-RNA

(c) Exon shuffling

(d) *m*RNA transport

(e) 5′ and 3′ modification of eukaryotic RNA

(f) Inhibitors of protein synthesis. 3.5×4=14

4. (a) Discuss the mechanism of regulation of tryptophan synthesis in *E.coli*. 8

(b) Explain the salient features of genetic code. 6

5. (a) Discuss in detail, the two major mechanisms of transcription termination in prokaryotes. 8

(b) Discuss how guide RNA edits the sequence information on *m*RNA. 3

(c) The percentage of cytosine in a double stranded DNA molecule is 18. Determine the percentages of the other three bases. 3

6. (a) Compare the three modes of replication— theta, rolling circle and semi-discontinuous with suitable diagrams. 9

(b) Explain with illustrations the structure of DNA as proposed by Watson and Crick. 5

7. (a) Discuss in detail, initiation of translation in eukaryotes. 9

(b) Discuss in detail the experiment which proved that RNA can also be the genetic material. 5

(5)

This question paper contains 4 printed pages. 18/5/18

Your Roll No. .....

Sl. No. of Ques. Paper: **6473** **HC**

Unique Paper Code : **3161402**

Name of Paper : **Ecology**

Name of Course : **B.Sc. (Hons.) Botany**

Semester : **IV**

Duration : **3 hours**

Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all.
Question No. 1 is compulsory.
All questions carry equal marks.

All parts of a question must be attempted together.

1. (a) Define any *five* of the following:

   (i) Ecotone

   (ii) Trophic Species

   (iii) Succession

   (iv) Food Web

   (v) Ecosystem

   (vi) Water Holding Capacity. $1\times5=5$

   (b) Give one word for any *five* of the following:

   (i) Shade loving plants

P. T. O.

(ii) Instrument used to measure light intensity

(iii) Water held by the surface forces of soil particles

(iv) Description of sum total of plant population covering a region

(v) Breakdown of parent rock matter by any agent into smaller particles

(vi) The earth and atmosphere in which the organisms live. 1×5=5

(c) Match the following:

	Column A	*Column B*
(i)	Hygrometer	Pedon
(ii)	Epiphyte	Relative Humidity
(iii)	Root Parasite	*Cuscuta*
(iv)	Soil Horizon	*Vanda*
(v)	Total Stem Parasite	*Orobanche*

5+5+5=15

2. Briefly explain any *five* of the following:

(a) Endemism

(b) Podsolization

(c) Light in relation to plants

(d) Physical effects of wind

(e) Ecological amplitude

(f) Decomposers. 3×5=15

3. Differentiate between any *five* of the following:

(a) Analytical Characters and Synthetic Characters

(b) Primary Production and Secondary Production

(c) Mor Humus and Mull Humus

(d) Crown Fire and Ground Fire

(e) Niche and Habitat

(f) Soil Texture and Soil Structure. 3×5=15

4. Write short notes on any *three* of the following:

(a) Soil Profile

(b) Continental Drift Theory

(c) Food Chains

(d) Ecological Pyramids. 5×3=15

5. Describe any *three* of the following:

(a) Vegetation of Delhi

(b) Carbon Cycle

(c) Productivity of Ecosystem

(d) Raunkiaer's Life Forms. 5×3=15

6. (a) What is Energy Flow in an ecosystem? Explain the Linear Energy Flow Model. 8

(b) With the help of a suitable diagram, explain the process of Succession in an aquatic environment. 7

(6) 24/5/18

This question paper contains 3 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **6474**

Unique Paper Code : **32161403** **HC**

Name of the Paper : **Plant Systematics**

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : **IV**

Duration : **3 Hours** Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *five* questions in all.

Question No. **1** is compulsory.

All questions carry equal marks.

Answer all parts of a question together.

1. (*a*) Expand the following abbreviations : 3

A.DC.; ICNCP; nom. cons.

(*b*) Write the alternative name and type genus of the following : 3

Compositae, Umbelliferae, Labiatae.

(*c*) Explain the significance of May 1, 1753 in Plant Systematics. 1

(*d*) Define the following : 4

Paraphyly, Monograph, Taxon, Homonym.

(*e*) Fill in the blanks : 4

(i) Engler considered.....pollinated flowers to be primitive.

P.T.O.

(ii) .....is known as the Father of Botany.

(iii) .....is the author of Flora of British India.

(iv) The standard size of a herbarium sheet is ..... .

2. Write short notes on the following (any *three*) : 3×5

(*a*) Rejection of names

(*b*) Single-Access keys

(*c*) Ranalian concept of a primitive flower

(*d*) Serology as a taxonomic tool

(*e*) Importance of herbaria in the field of systematics.

3. (*a*) Differentiate between the following (any *three*) : 3×3

(i) Apomorphy and Plesiomorphy

(ii) Edge punched and body punched card keys

(iii) Parallelism and Convergence

(iv) Autonym and Tautonym.

(*b*) Interpret the following :

(i) *Capparis lasiantha* R.Br. ex DC. 1

(ii) *Lupinus* [Tourne.] Linn. 1

(iii) X *Triticosecale* 1

(iv) *Rosa floribunda* "Blessings" 1

(v) *Fumaria solida* (L.) Miller 2

Fumaria bulbosa var. *solida* L.

4. (*a*) Discuss the role of flavonoids in improving the classification of Centrospermae. 5

(*b*) Explain the hypothesis of Herbaceous Origin of Angiosperms. 5

(*c*) Write a short note on the Taxonomic Species Concept. 5

5. (*a*) Differentiate between Phylogenetic and Natural systems of classification. 3

(*b*) (*i*) Outline the system of classification proposed by Engler and Prantl. 4

(*ii*) Discuss its merits and demerits. 8

6. (*a*) Name the authors of the following : 5

(*i*) Pinax theatri botanici

(*ii*) Theorie elementaire de la botanique

(*iii*) Genera Plantarum

(*iv*) Flora of Delhi

(*v*) Die Evolution der Angiospermen.

(*b*) Palynological information is considered reliable in establishing the evolutionary history of angiosperms. Discuss with the help of suitable examples. 8

(*c*) Explain Heterobathmy with suitable examples. 2

7. (*a*) What is typification ? Explain any *five* kinds of types. 6

(*b*) List the Neo-Adansonian Principles. Outline the steps involved in Numerical Taxonomic Analysis. 3+6