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[This question paper contains 4 printed pages.

Your Roll No. : .....

2019

Sl. No. of Q. Paper : **2194** **IC**

Unique Paper Code : 32161401

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

Name of the Paper : Molecular Biology

Semester : IV

Time : 3 Hours ***Maximum Marks : 75***

Instructions for Candidates :

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

(b) Question **No. 1** is compulsory and attempt **five** questions in all.

(c) Attempt all parts of the question together.

1. (a) Give major contributions of the following (any **five**) : 5×1=5

(i) M. Meselson and F. W. Stahl

(ii) H. G. Khorana

(iii) F. Meischer

(iv) J. H. Taylor

(v) R. W. Holley

P.T.O.

(vi) C. Yanofsky

(vii) M. Kozak

(b) Expand the following (any **five**) : 5×1=5

(i) SSB

(ii) GTF

(iii) CRP

(iv) IGS

(v) UTR

(vi) ORC

(c) Define (any **five**) : 5×1=5

(i) Hyperchromicity

(ii) Ribozyme

(iii) Shine-Dalgarno sequence

(iv) Operon

(v) Okazaki fragment

(vi) Catenation

2. Differentiate between any **five** of the following with the help of labelled digrams : 5×3=15

(i) A-DNA and Z-DNA

(ii) Pribnow box and Hogness box

(iii) Constitutive and facultative Heterochromatin

(iv) Nucleotide and Nucleoside

(v) DNA Pol I and DNA Pol III

(vi) Eukaryotic and Prokaryotic ribosome

3. Write short notes on any **three** of the following and draw labelled diagrame : 3×5=15

(i) Nucleosome structure

(ii) Inhibitors of protein synthesis

(iii) Rolling circle model of DNA replication

(iv) Mitochondrial genome

(v) Gene silencing

4. (a) Briefly describe the regulation of Tryptophan synthesis in *E. coli.* 10

(b) Discuss the experiments that helped in deciphering the genetic code. 5

5. (a) Discuss the role of various proteins that assemble at the replication fork during prokaryotic DNA replication. 9

(b) Describe Fraenkel-Conrat's experiment which proved that RNA is the genetic material. 6

6. (a) Explain in detail the initiation of translation in Prokaryotes and Eukaryotes. 9

(b) Name and compare the three classes of RNA splicing. 6

7. (a) Explain transcription termination in prokaryotes and eukaryotes. 10

(b) Briefly describe exon shuffling. 5

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Your Roll No. : .....

Sl. No. of Q. Paper : **2195** **IC**

Unique Paper Code : 32161402

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

Name of the Paper : Ecology

Semester : IV

Time : 3 Hours ***Maximum Marks : 75***

Instructions for Candidates :

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

(b) Attempt **five** questions in all.

(c) Question **No. 1** is compulsory.

(d) **All** questions carry equal marks.

(e) All parts of questions must be attempted together.

1. (a) Define any **five** of the following : 5×1=5

(i) Endemism

(ii) Carrying capacity

(iii) Soil texture

P.T.O.

(iv) Ecotone
(v) Weathering
(vi) Ecesis
(vii) Ecological amplitude
(viii) Mortality

(b) Fill in the blanks : 5×1=5

(i) The amount of inorganic substances present in the environment of an ecosystem is called.....

(ii) .....is an instrument used to measure light intensity.

(iii) The soils transported by wind is called as.....

(iv) ..... is an example of stem parasite.

(v) The ability of an organism for self regulation which enables them to adjust to changing environment is called.....

(c) Match the following : 5×1=5

Column A	Column B
(i) Holard	(a) *Pinus*
(ii) Epiphyte	(b) Warmer uppermost layer of water body
(iii) Serotiny	(c) Total water in soil
(iv) Psammosere	(d) A plant growing on another plant
(v) Epilimnion	(e) Succession occurring on sand

2. Write short notes on any **three** of the following : 3×5=15

(a) Habitat and Ecological Niche
(b) Vegetation of Delhi
(c) Raunkiaer's life forms
(d) Survivorship curves
(e) Precipitation types

3. Differentiate between any **five** of the following : 5×3=15

(a) Net primary productivity & Gross primary productivity
(b) Mor humus & Mull humus
(c) Primary succession & Secondary succession
(d) Food chain & Food web
(e) Heliophytes & Sciophytes
(f) Natural ecosystem & Artificial ecosystem

4. (a) Define Biogeochemical cycle. Explain nitrogen cycle with suitable diagram. 5

(b) Discuss the beneficial effects of fire. 5

(c) Define age pyramid. Describe briefly the different types of age pyramids along with the suitable diagrams. 5

5. (a) Define Endemism. Give a brief account of any **two** phytogeographical zones of India. 5

(b) Write an account on analytical characteristics of a community. 5

(c) What is soil profile ? Briefly explain with the help of suitable diagram. 5

6. (a) Briefly discuss the "Thermal Stratification" in a standing water body. 5

(b) Explain the different forms of water in soil. 5

(c) Give an account on Y- shaped energy flow model. 5

OR

Comment on "Wind as an ecological factor".

7. (a) What is Ecological Succession ? Explain various stages of hydrosere with the help of suitable diagram. 8

(b) Describe various types of positive interactions amongst the living organisms by citing suitable examples. 7

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Sl. No. of Q. Paper : **2196** **IC**

Unique Paper Code : 32161403

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

Name of the Paper : Plant Systematics

Semester : IV

Time : 3 Hours ***Maximum Marks : 75***

Instructions for Candidates :

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

(b) Attempt **five** questions in all.

(c) Question **No.1** is compulsory.

(d) Attempt **all** parts of a question together.

(e) **All** questions carry equal marks.

1. (a) Fill in the banks : 5

(i) ..... has given sexual system of classification.

(ii) .....is the author of *Theorie elementaire de la botanique.*

(iii) ..... is the alternative name of Umbelliferae.

P.T.O.

(iv) .....is the author of ' The Flora of Delhi'.

(v) ..... is the father of Genus Concept.

(vi) The taxonomic category indicated by the suffix '-opsida' is.....

(b) Expand the following (any **five**) : 5

(i) nom. nud.

(ii) IAPT

(iii) ICN

(iv) DC.

(v) nom. cons.

(vi) ICNCP

(c) Where are the following located : 2

(i) National Botanical Research Institute

(ii) Royal Botanical Garden

(d) Define the following (any **three**) : 3

(i) Holotype

(ii) Heterobathmy

(iii) Plesiomorphy

(iv) Taxon

2. Write short note on any **three** of the following : 3×5=15

(a) Principle of priority and its limitations

(b) Polyclaves

(c) Roles of a herbarium

(d) Co-evolution of angiosperms and animals

3. (a) Describe the system of classification given by Bentham and Hooker for seed plants upto series. Explain the merits and demerits of this classification system. 7+4=11

(b) What is a flora ? Give **one** example each of local, regional and continental flora with their authors. 4

4. Differentiate between any **three** : 3×5=15

(i) Phenetic and phylogenetic classification

(ii) Primitive and Advanced characters

(iii) Parallelism and Convergence

(iv) Phenogram and Cladogram

5. (a) What cytological data are used in plant systematics ? Discuss their role in solving taxonomic problems with examples. 8

(b) Write Principles of numerical taxonomy. Give any **three** merits and demerits. 7

6. Briefly discuss any **three** : 3×5=15

(i) The herbaceous origin hypothesis of angiosperm.

(ii) Rejection of scientific names.

(iii) Biological species concept.

(iv) APG (III) classification

7. (a) Interpret the following :

(i) *Delphinium viscosum* Hook. et. Thomson 1

(ii) X *Triticose-cale* 1

(iii) *Rosa webbiana* + *Rosa floribenda* 1

(iv) *Cynodon dactylon* (Linn.) Pers. *Panicum dactylon* Linn. 2

(b) Name the authors who have used the following groups name in their classification (any **five**) : 5×1=5

(i) *Ordines anomali*

(ii) Liliopsida

(iii) Gamopetalae

(iv) Heteromerae

(v) Diandria

(vi) Embryophyta

(c) Give an example for the following (any **five**) : 5×1=5

(i) Autonym

(ii) Species name after the name of a taxonomist

(iii) Generic name based on a place

(iv) Monotypic family

(v) Monograph

(vi) Index