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(14)

Your Roll No. 2022

Sr. No. of Question Paper : 1141

A

Unique Paper Code : 32161401

Name of the Paper : Molecular Biology

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

Semester : IV

Duration : 3:30 Hours

Maximum Marks : 75

Instructions for Candidates

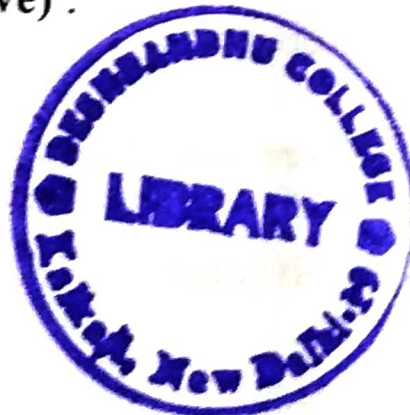
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all.
3. Question No. 1 is compulsory.
4. All parts of a question should be answered together.

1. (a) Expand (any five) :

(1×5=5)

(i) RISC

(ii) TBP



P.T.O.

- (iii) ORF
- (iv) miRNA
- (v) CAP
- (vi) snRNA

(b) Write the contributions of **(any five)** : (1×5=5)

- (i) John Cairns
- (ii) Francis Crick
- (iii) H. G. Khorana
- (iv) Fire and Mellow
- (v) R.W. Holley
- (vi) Fraenkel-Conrat



(c) Define the following **(any five)** : (1×5=5)

- (i) Spliceosome
- (ii) Repressor
- (iii) Hyperchromicity
- (iv) Polysome

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(v) Processivity

(vi) Split gene

2. Differentiate between the following (**any five**) :

(3×5=15)

(i) B-DNA and Z-DNA

(ii) DNA Polymerase I and DNA Polymerase III

(iii) Constitutive and Facultative Heterochromatin

(iv) Rho-dependent and Rho-independent termination

(v) Primosome and Replisome

(vi) Repression and Derepression

3. Write short note on (**any three**) :

(5×3=15)

(i) Attenuation in *Trp* Operon

(ii) DNA packaging in eukaryotes

(iii) Post-translational modification of proteins

(iv) Mechanism of RNAi

P.T.O.

4. (a) Discuss in detail, the role of general transcription factors involved in initiation of transcription in eukaryotes. (9)
- (b) Describe the events that help in modification of eukaryotic RNA. (6)
5. (a) Describe the mechanism of positive and negative regulation in lac operon. (10)
- (b) Name two unusual bases present in tRNA. (1×2=2)
- (c) Write down the location for the following (**any three**): (1×3=3)
- (i) Pribnow Box
 - (ii) Polyadenylation signal
 - (iii) Shine-Dalgarno Sequence
 - (iv) 3' splice site
6. (a) With the help of a well labelled diagram, explain semi-discontinuous and bidirectional replication in



a replication bubble of linear DNA. Also show 3' & 5' orientation of template, leading & lagging strands and direction of two replication forks.

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- (b) Discuss how genetic code was deciphered? Explain the degeneracy of genetic code. (5)
- (c) List the target site and consequences of any three antibiotics inhibiting translation. (5)
7. (a) What is tRNA charging? Discuss in detail, initiation of translation in prokaryotes. (9)
- (b) If the percentage of cytosine in double stranded DNA molecule is 20, determine the percentage of other 3 bases. (3)
- (c) Give the possible reasons for the following (**any three**): (1×3=3)
- (i) DNA polymerase cannot initiate replication on its own.
 - (ii) Transcription has lower fidelity than replication.

- (iii) Mitochondrial and chloroplast DNA show similarity with bacterial DNA
- (iv) Genetic code is triplet in nature.



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Your Roll No. 2022

Sr. No. of Question Paper : 1368

A

Unique Paper Code : 32161402

Name of the Paper : Ecology

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

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. Question No. 1 is compulsory.
4. **All** questions carry equal marks.
5. All parts of a question must be answered together.

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1. (a) Define the following terms (Attempt any **Seven**) :
(1×7=7)

P.T.O.

- (i) Soil texture
- (ii) Pedogenesis
- (iii) Hydrological cycle
- (iv) Sciophyte
- (v) Homeostasis
- (vi) Autecology
- (vii) Glacial soil
- (viii) Thermocline
- (ix) Ecological amplitude



(b) Give one word for the following : (1×8=8)

- (i) Interlocking food chains
- (ii) A process of nutrient enrichment in water bodies
- (iii) Soil transported by running water
- (iv) Organisms which feed on the dead bodies of other organisms

- (v) An angiosperm which grows as a total stem parasite
- (vi) A process of nutrient enrichment in water bodies.
- (vii) Small organisms which feed on dead bodies of other organisms.
- (viii) Transition zone of a species

2. Differentiate between the following (Attempt any **five**) : (5×3=15)

- (i) Autotrophic and Heterotrophic Succession
- (ii) Analytical Characters and Synthetic Characters
- (iii) Commensalism and Ammensalism
- (iv) Gravitational Water and capillary water
- (v) Predator and Parasite
- (vi) Ecads and Ecotypes
- (vii) Tropical forest and Temperate Forests



3. (a) Discuss the sequence of processes occurring during a primary succession. (5)

(b) Nitrogen Cycles are perfect cycles. Explain nitrogen cycling in nature with the help of a well labelled diagram showing all the reservoirs and processes. (5)

(c) Briefly comment on the influence of light on the distribution of plants. (5)

4. Write short notes on (any **three**): (5×3=15)

(i) Biological spectrum

(ii) Shelford's law of Tolerance

(iii) Soil organisms

(iv) Mutualism

(v) Growth curves



5. (a) What are ecological pyramids? Who gave the concept? Discuss in brief the Pyramids of biomass and the limitations of these pyramids.

(5)

- (b) Mention the theories proposed for climax. How are the theories different? (5)
- (c) Give a detailed account of vegetation in Tropical Rain Forests in India. (5)
6. (a) Discuss the various trophic levels in an ecosystem. Why are the number of trophic levels limited? (5)
- (b) Give a brief account of seasonal Vegetation of Delhi. **Deshbandhu College Library, Karkaji, New Delhi-19** (5)
- (c) Define the theory of continental drift. What are the various types of endemics? Discuss in brief. (5)
7. (a) Explain the cycling of Phosphorus in nature. Is it a sedimentary or a gaseous cycle? (5)
- (b) What is water holding capacity? How is it different from field capacity? Suggest two methods that can help in improving the water holding capacity of soils. (5)

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(c) Draw a schematic representation of Y shaped energy flow model? Explain the main features of this model.

(5)



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Your Roll No. 2022

Sr. No. of Question Paper : 1386

A

Unique Paper Code : 32161403

Name of the Paper : Plant Systematics

Name of the Course : B.Sc. (H) Botany

Semester : IV

Duration : 3 Hours 30 Minutes

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All questions carry equal marks.
3. Question Number 1 is compulsory. Attempt total 5 questions in all.
4. Attempt all parts of a question together.
5. Draw diagrams wherever necessary.

1. (a) Expand the following (any five) : (1×5=5)

(i) ICN

(ii) IAPT



P.T.O.

- (iii) APG
- (iv) OTU
- (v) UPGMA
- (vi) R. Br.

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

- (i) Manual
- (ii) Homoplasy
- (iii) Monophyly
- (iv) Synonym
- (v) Taxa
- (vi) Clade



(c) Fill in the blanks (**any five**): (1×5=5)

- (i) The starting date for botanical nomenclature is _____
- (ii) The taxonomic category indicated by the suffix '-phyta' is _____

(iii) Carolus Linnaeus authored the book

(iv) The concept to binomial nomenclature was
given by _____

(v) Free central placentation is considered as
an _____ character compared to axile
placentation.

(vi) The standard size of a herbarium sheet is

2. Write note on following (**any three**) : (5×3=15)

(a) Herbaceous origin theory of angiosperms

(b) Principles of ICN Deshbandhu College Library
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(c) Biological species concept

(d) Contributors of phylogenetic systems of
classification

3. Differentiate Between (**any five**) : (3×5=15)

(a) Artificial and Phylogenetic systems of classification

(b) Phenogram and Cladogram

- (c) Holotype and Syntype
- (d) Regional flora and Local flora
- (e) Parallelism and Convergence
- (f) Diagnosis and Description



4. Give a detailed account of a natural **OR** a phylogenetic classification. Also enlist the merits and demerits.
(12+3= 15)
5. (a) Discuss the role of palynology **OR** phytochemistry in plant systematics with suitable examples.
(7.5)
- (b) What are taxonomic keys? Discuss various types of single access keys with their features and utility.
(7.5)
6. (a) Give an example of following (**any five**) :
(1×5=5)
- (i) Genus named after a person
 - (ii) A database that consists of images of herbarium
 - (iii) Tautonym

- (iv) Most primitive living angiosperm
 - (v) Journal devoted to taxonomy
 - (vi) Regional Flora
- (b) What are the merits of numerical taxonomy over conventional taxonomy? (6)

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Discuss Principle of Priority and its limitations?

- (c) Interpret the following (**any four**) : (1×4=4)
- (i) *Acacia nilotica* (Linn.) Del. ssp. *nilotica*
 - (ii) *Gossypium tomentosum* Nutt, ex Seem
 - (iii) *Salix aurita* x *S. caprea*
 - (iv) *Phyllanthus* Linn, emend. Mull.
 - (v) X *Triticale*

7. (a) What are the roles of Botanical Gardens? Name any one national and one international botanical garden of repute and briefly highlight their key features. (2+2+2=6)

(b) Write alternate name and type genus of the following families (**any five**) : (5)

Cruciferae, Umbelliferae, Labiatae, Compositae, Gramineae, Palmae

(c) Write a note on characters and character coding in cladistics methodology. (4)

