लक्ष्यं विद्यमानम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 4th Semester Examination, 2023

BOTACOR08T-BOTANY (CC8)

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

1. Answer the following questions in brief: 1×6 = 6

(a) State the components of nucleosome core.

(b) What is ribozyme?

(c) Name one inhibitor of protein synthesis.

(d) What is TATA Box? Where is it located?

(e) Why is a primer needed for initiation of DNA replication?

(f) In a double stranded DNA molecule, the percentage of cytosine is 32. What would be the percentage of Adenine?

2. Answer any ***eight*** questions from the following: 3×8 = 24

(a) To prove DNA as genetic material briefly describe the Avery-MacLeod-McCarty experiment (1944). 3

(b) Why is Lac operon called an inducible operon? What is CAP in Lac operon? 2+1

(c) Name different enzymes involved in the process of DNA replication. 3

(d) Distinguish between B-DNA and Z-DNA. 3

(e) Compare euchromatin and heterochromatin. 3

(f) How does organelle DNA differ from chromosomal DNA? Mention the salient features of mtDNA. 2+1

(g) Describe the process of Rho (ρ) dependent termination in prokaryotes. 3

(h) What are the functions of Poly-A tail? Name the enzyme that synthesizes Poly-A tail. 2+1

(i) What is Cot Curve? Mention the factors that control Tm. 1+2

(j) What is RNA-editing? Mention the role of guide RNA in RNA editing mechanism. 1+2

(k) Give a brief account of spliceosome mediated processing of mRNA. 3

(l) Below in the sequence of a mRNA from a bacteria — 3

5′ A U G G G C U C C A U C G G C G C A U A A 3′

(i) How many amino acid long is the protein?

(ii) How many tRNAs will be required to make this protein?

(iii) What is the 4th Codon in the mRNA?

(m) What is the role of amino-acyl-tRNA-synthetase in translation process? Briefly mention the function of different protein factors involved in initiation of translation. 1+2

3. Answer any *two* questions from the following: 5×2 = 10

(a) Give a concise account of rolling circle mode of DNA replication. How are the formation of leading and lagging strands coordinated during replication process? 3+2

(b) Describe the structure of tryptophan operon. How is trp operon regulated by attenuating transcription? What is an apoinducer? 2+2+1

(c) Why DNA polymerases have 3′ to 5′ exonuclease activity? What would be the consequences of mutating this activity? Briefly describe an experiment to prove that DNA replication is semi-conservative in nature. 1+1+3

(d) With suitable diagram briefly describe how initiation factors (IFs) help in the initiation process of translation in prokaryotes. What is the function of peptidyl transferase? 4+1

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लक्ष्यं विश्रमानम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 4th Semester Examination, 2023

BOTACOR09T-BOTANY (CC9)

PLANT ECOLOGY AND PHYTOGEOGRAPHY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

1. Answer the following questions: 1×6 = 6
   (a) Define plant ecology.
   (b) What is an ecotype?
   (c) What is speciation?
   (d) Define standing crop.
   (e) Write the name of an endemic plant.
   (f) Give an example of tropical rainforest.

2. Answer any ***eight*** questions from the following: 3×8 = 24
   (a) What are the chemical and biological components of the soil? $1\frac{1}{2}+1\frac{1}{2}$
   (b) What do you mean by 'water table'? Define aquifer. 2+1
   (c) Mention the adaptations of plants to temperature and wind factors. $1\frac{1}{2}+1\frac{1}{2}$
   (d) What are the various states of water in the environment?
   (e) Explain the ecological trophic organisation.
   (f) Differentiate between food chain and food web.
   (g) Differentiate between 'r' and 'k' selection of the population with examples.
   (h) Define the term niche. Explain what is fundamental niche. 1+2
   (i) Distinguish between symbiosis and parasitism with an example for each. $1\frac{1}{2}+1\frac{1}{2}$
   (j) Explain Shelford's law of tolerance with diagram.
   (k) Explain exponential and logistic growth patterns.
   (l) Explain biogeochemical cycle in the atmosphere.

3. Answer any ***two*** questions from the following: 5×2 = 10
   (a) Explain the process of plant succession with proper diagram. 3+2
   (b) Explain the ecotone and mention the importance of edge effect. 2+3
   (c) With suitable diagram, briefly discuss the Carbon Cycle.
   (d) Write a note on the phytogeographical divisions of India as given by BSI (1996).

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सत्यं विद्यायनम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 4th Semester Examination, 2023

BOTACOR10T-BOTANY (CC10)

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

1. Answer the following questions: 1×6 = 6
   (a) Who is regarded as the 'Father of Indian Botany'?
   (b) What do you mean by natural system of classification?
   (c) What is meant by 'CAL'?
   (d) What is 'nomen ambiguum'?
   (e) What is alpha taxonomy?
   (f) Define Taximetrics.

2. Answer any ***eight*** questions from the following: 3×8 = 24
   (a) Write a short note on the contribution of Linnaeus to plant taxonomy. 3
   (b) Write three hierarchical ranks of plants above the rank of genus in proper sequence with example. 3
   (c) Compare isotype and paratype with examples. 3
   (d) What are semantides? How do they differ from secondary metabolites? 2+1
   (e) Give a brief idea of Virtual Herbarium and mention its significance. 2+1
   (f) Distinguish between monographs and journals giving one example for each. 3
   (g) Explain 'parallelism' and 'convergence' in term of evolution. $1\frac{1}{2}+1\frac{1}{2}$
   (h) Name the major informal groups of APG-III classification, 2009. Write two basic differences of this classification from other phylogenetic systems. 2+1
   (i) Discuss the concept of OTU and OEU. 3
   (j) Differentiate indented and bracketed keys. 3
   (k) Name two Botanical Gardens present in West Bengal. Name the largest Botanical Garden of the world. 1+1+1
   (l) Write the full form of ICBN and ICN. Name the First code of Botanical Nomenclature and mention its year. 2+1

3. Answer any ***two*** questions from the following: 5×2 = 10
   (a) Write the principles of ICN in proper sequence. 5
   (b) Give an outline of Engler and Prantl's system of classification upto subclasses with salient features. Point out one of its merits and demerits. 4+1
   (c) Give a brief idea of Biological species concept. Mention its limitations. 3+2
   (d) Enumerate the pollen characters of Taxonomic importance. Cite two examples for application as taxonomic markers. 2+3

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लक्ष्यं विद्यमानम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours/Programme 4th Semester Examination, 2023

BOTHGEC04T/BOTGCOR04T-BOTANY (GE4/DSC4)

PLANT PHYSIOLOGY AND METABOLISM

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks. Candidates should answer in their own words and adhere to the word limit as practicable.

প্রান্তিক সীমার মধ্যস্থ সংখ্যাটি পূর্ণমান নির্দেশ করে। পরীক্ষার্থীরা নিজের ভাষায় যথা সম্ভব শব্দসীমার মধ্যে উত্তর করিবে।

1. Answer any ***sixteen*** questions from the following: 1×16 = 16
নিম্নলিখিত যে-কোনো *ষোলোটি* প্রশ্নের উত্তর দাওঃ

(a) What is imbibition?
আত্মভূতি কাকে বলে ?

(b) Explain 'Root-pressure' theory on water translocation in plants.
উদ্ভিদ জল পরিবহনে 'মূলজ চাপ' তত্ত্বটি বুঝিয়ে বলো।

(c) What is capillary water?
কৈশিক জল কাকে বলে ?

(d) What is chlorosis?
ক্লোরোসিস কাকে বলে ?

(e) What do you mean by respiratory quotient?
শ্বাস অনুপাত কাকে বলে ?

(f) What is 'kranz' Anatomy?
'ক্রাঞ্জ' অ্যানাটমী কি ?

(g) Name two amino acid form in C_2 cycle.
C_2 চক্রে উৎপন্ন দুটি জৈব অ্যাসিডের নাম লেখো।

(h) What is absorption spectrum?
শোষণ বর্ণালী কি ?

(i) Cite two differences between aerobic respiration and fermentation.
সবাত শ্বসন ও সন্ধানের মধ্যে দুটি পার্থক্য লেখো।

(j) What is the function of Nod Gene?
নড-জিনের কাজ কি ?

(k) What is the full form of GOGAT?
GOGAT-এর সম্পূর্ণ নাম কি ?

(l) Give a name and source of natural cytokinin.
একটি প্রাকৃতিক সাইটোকাইনিনের নাম ও উৎস লেখো।

(m) What is Florigen?
ফ্লোরিজেন কি ?

(n) Name one gaseous plant hormone.
একটি গ্যাসীয় উদ্ভিদ হরমোনের নাম লেখো।

(o) Define 'Biological clock'.
বায়োলজিকাল ক্লকের সংজ্ঞা দাও।

(p) What is 'apoenzyme'?
'অ্যাপোএনজাইম' কাকে বলে ?

(q) Define critical day length.
সন্ধিক্ষণকালীন দিবা দৈর্ঘ্য-এর সংজ্ঞা দাও।

(r) What do you mean by antitranspirant?
প্রস্বেদন-প্রতিরোধী বলতে কি বোঝো ?

(s) Mention two deficiency symptoms of phosphorus in plant.
ফসফরাসের দুটি অভাবজনিত লক্ষণ উল্লেখ করো।

2. Answer any ***eight*** questions from the following: $3\times8 = 24$
নিম্নলিখিত যে-কোনো *আটটি* প্রশ্নের উত্তর দাওঃ

(a) Define osmosis and diffusion. State the differences between osmotic pressure and turgor pressure. 1+1+1
অভিস্রবন এবং ব্যাপনের সংজ্ঞা দাও। অভিস্রবন চাপ এবং স্ফীতি চাপের পার্থক্যগুলি লেখো।

(b) Cite the general role of essential elements.
অত্যাবশ্যক পরিপোষকের সাধারণ ভূমিকাগুলি লেখো।

(c) What is transpiration? Mention different types of transpiration in plants. 1+2
বাষ্পমোচন কি ? বাষ্পমোচনের বিভিন্ন প্রকারভেদগুলি উল্লেখ করো।

(d) Distinguish between photosynthetic and respiratory phosphorylation.
সালোকসংশ্লেষীয় এবং শ্বসনীয় ফসফরিভবনের পার্থক্যগুলি লেখো।

(e) Mention the dual role of enzyme 'RUBISCO'.
RUBISCO উৎসেচকের দ্বৈত ভূমিকা উল্লেখ করো।

(f) Discuss the 'Mass-flow hypothesis' by Munch.
Munch দ্বারা উল্লেখিত 'দ্রাবের ভরপ্রবাহ' প্রকল্পটি লেখো।

(g) Write the significance of 'Krebs cycle'.
'ক্রেব্‌স সাইকেলের' গুরুত্ব লেখো।

(h) What do you mean by biological Nitrogen fixation? Discuss ammonification process by bacteria within soil. 1+2
জৈব নাইট্রোজেন সংবন্ধন বলতে কি বোঝো ? ব্যাকটেরিয়া দ্বারা অ্যামোনিফিকেশন পদ্ধতিটি আলোচনা করো।

(i) State the effects of temperature and pH on enzymatic reactions. $1\frac{1}{2}+1\frac{1}{2}$
উৎসেচক বিক্রিয়ায় উষ্ণতা ও pH-এর প্রভাব সম্পর্কে আলোচনা করো।

(j) Discuss application of plant hormone in agriculture.
উদ্ভিদ হরমোনের কৃষিক্ষেত্রে ব্যবহারিক প্রয়োগ সম্পর্কে আলোচনা করো।

(k) What are the features of phytochrome?
ফাইটোক্রোমের প্রধান বৈশিষ্ট্যগুলি কি ?

(l) Explain the process of Vernalization.
বাসন্তীকরণ পদ্ধতিটি বর্ণনা করো।

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