

2021

BOTANY — HONOURS

Paper : CC-13

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** questions from the following: 2×5
 - (a) What is 'biological clock'?
 - (b) Name one naturally occurring cytokinin.
 - (c) What do you mean by 'cavitation' and 'embolism'?
 - (d) What do you mean by vernalization?
 - (e) Mention one symptom each caused by magnesium and boron deficiency in plants.
 - (f) Write two differences between apoplastic and symplastic loading mechanisms.
 - (g) What is 'Richmond Lang effect'?
 - (h) Write two differences between primary and secondary seed dormancy.

2. Answer **any two** questions from the following:
 - (a) Write a short note on 'P-protein'. Write one merit and one demerit of mass flow model of phloem transport mechanism in plants. 3+2
 - (b) Write the role of ABA in senescence. 5
 - (c) Describe the role of cryptochrome in photomorphogenesis. 5

3. Answer **any three** questions from the following:
 - (a) Briefly describe the IAA mediated cell growth mechanism in plants. Write the importance of brassinolides in regulating plant growth. 5+5
 - (b) Briefly describe the different strategies of breaking seed dormancy. How does GA and ABA ratio regulate seed germination in plants? 5+5
 - (c) Write two differences between macronutrients and micronutrients. Write the importance of phosphate in plant nutrition. Briefly describe the different components of 'Hogland solution'. 2+4+4
 - (d) With illustrations describe the role of CO₂ and blue light in opening and closing of stomata. 5+5
 - (e) What is photoperiodism? Give an account of chemical nature of phytochrome. Discuss the role of phytochrome in photomorphogenesis. 2+3+5

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BOTANY — HONOURS

Paper : CC-14

Full Marks : 50

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1. Answer the following questions (*any five*): 2×5
- (a) Where does substrate level phosphorylation occur in glycolysis?
 - (b) What is 'Quantasome'? Write the chemical formula of chlorophyll a.
 - (c) What is 'uncoupler'? Cite one example.
 - (d) What is an 'action spectrum'?
 - (e) What is the function of 'G protein'?
 - (f) Write down the reaction catalysed by the enzyme 'GOGAT'.
 - (g) Define isoenzyme with example.
 - (h) How is triglyceride formed?
2. Answer *any two* questions from the following: 5×2
- (a) Mention the biological significance of carotenoid pigments.
 - (b) Mention the biochemical reactions involved in the conversion of pyruvate to Acetyl CoA.
 - (c) Write notes on allosteric regulation of enzymes with examples.
3. Answer *any three* questions from the following:
- (a) Why is the pentose phosphate pathway also called a shunt pathway? Schematically describe the pathway giving structures of substrates and products with the names of enzymes involved in each step. 2+8
 - (b) 'Crassulacean Acid Metabolism in an ecophysiological adaptation of desert plants.' Justify the statement with biochemical details. How do CAM plants differ from C₄ plants? 6+4
 - (c) Discuss the role of Ca²⁺ as second messenger with reference to signal transduction pathway. 10
 - (d) Write down the biochemical reactions of β oxidation of fatty acids. Mention the stoichiometry of ATP production after complete oxidation of palmitic acid (C = 16). 6+4
 - (e) Describe the biochemistry of Nitrogen fixation with special reference to the role of Nitrogenase and leg-haemoglobin. 6+4
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2021

BOTANY — HONOURS

Paper : DSE-A-3

(Medicinal and Ethnobotany)

Full Marks : 50

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*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** questions: 2×5
- (a) What is Pharmacopoeia? Give an example.
 - (b) What are unorganized drugs? Give one example.
 - (c) Write one therapeutic use of Diosgenin and state the chemical nature of it.
 - (d) What are curcuminoids? Name the source plant.
 - (e) What is 'gutta-percha'?
 - (f) Give one example each from macrobotanical and microbotanical evidences of Paleoethnobotany.
 - (g) What do you mean by Unani system of medicine?
 - (h) Why terpenes are referred to as isoprenoids?
2. Answer **any two** of the following:
- (a) Write a short note on principles and applications of Ayurveda system of medicine. 5
 - (b) Write a brief note on the following: 2½+2½
 - (i) organoleptic evaluation
 - (ii) biological evaluation.
 - (c) What do you mean by polyherbal formulations? Cite an example of polyherbal formulation effective against a particular disease. 4+1
3. Answer **any three** of the following:
- (a) Explain with an example how quantitative microscopy is used in drug evaluation. Discuss the classification of drugs on the basis of chemical constitution and therapeutic effect. Cite a few merits and demerits based on these classifications. 2+3+3+1+1

Please Turn Over

(b) Mention the source plants, parts used, one therapeutic application and the chemical nature of the following drugs: ($\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}$) \times 5

(i) Atropine

(ii) Catechin

(iii) Solasodine

(iv) Capsaicin

(v) Gingerol.

(c) Write the protective action of phenolics and terpenoids against pathogenic microbes and herbivores. 5+5

(d) What do you mean by folk medicine? Write some remedies from natural sources for the treatment of: 1+3+3+3

(i) jaundice

(ii) infertility

(iii) cardiac disorders.

(e) Give an outline of inter-relationship of basic primary and secondary metabolite biosynthesis in plants. Distinguish between true alkaloids and proto-alkaloids with examples. Write the source and uses of vinblastin. 5+3+2

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BOTANY — HONOURS

Paper : DSE-B-8

(Natural Resource Management)

Full Marks : 50

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as far as practicable.*

1. Answer **any five** questions : 2×5
- (a) Distinguish between agricultural and pastoral land.
 - (b) What do you mean by bioprospecting?
 - (c) Write the full form of IUCN. State one major objective of IUCN.
 - (d) Mention the important criteria for the progress in economic sustainability.
 - (e) Distinguish between forest cover and tree cover.
 - (f) What are the four Rs used as basic principle of solid waste management?
 - (g) Define non-renewable resource. Give an example.
 - (h) What do you mean by environmental refugees?
2. Answer **any two** questions :
- (a) Write short notes on the importance of Agroforestry. 5
 - (b) What is EIA? Briefly state the importance of EIA on biodiversity conservation. 1+4
 - (c) Write a brief account on application of GIS in natural resource management. 5
3. Answer **any three** questions :
- (a) Briefly discuss the concept of sustainable utilisation of natural resources. Describe the management strategies for soil degradation. 5+5
 - (b) Define Biodiversity. State the significance and threats of Biodiversity. Enumerate briefly the National Biodiversity Action Plan of India. 2+4+4
 - (c) Comment on the forest types found in India. Mention the reasons for depletion of forest in India. 6+4

Please Turn Over

- (d) What are wetlands? Comment on the importance of wetlands. Enumerate the threats to wetlands. Name any two Ramsar sites in India. 2+3+3+2
- (e) Distinguish between conventional and non-conventional source of energy. 'Sun is the ultimate source of energy'. – Justify this statement. 5+5
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