

PGS-251009
Autonomous Examination DEC-2025
SEMESTER-I
M.Sc.- Botany
Paper – I (Cell and Molecular Biology)

Time : 3 Hours

M.M. : 70

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

Objective type questions Attempt any 10 questions out of 12 given below.
(1 x 10 = 10)

- (i) The enzyme responsible for unwinding DNA during replication is -
(a) DNA polymerase (b) DNA ligase
(c) Helicase (d) Primase
- (ii) The function of the proteasome is -
(a) Protein folding (b) Protein degradation
(c) Protein synthesis (d) Protein Glycosylation
- (iii) The lac operon in E. coli is induced when.
(a) Lactose and glucose are both high
(b) Lactose is absent
(c) Lactose is present and glucose is low
(d) Lactose and glucose are both absent
- (iv) Which type of RNA carries amino acids to the ribosomes during translation.
(a) mRNA (b) t RNA
(c) r RNA (d) Sn RNA
- (v) The phase of the cell cycle in which DNA is replicated is -
(a) G₁ phase (b) S phase
(c) G₂ phase (d) M phase
- (vi) Ribosomes are the site of
- (vii) The blotting technique which is used to detect the RNA in a sample is.....
- (viii) A cell with 3n chromosome number is called.....
- (ix)is the main component of the plasma membrane.
- (x) Gel electrophoresis separates nucleic acid molecules based on

(02)

- (xi) DNA polymerase T enzyme is responsible for removing RNA primers during DNA replication in PK. (True/False)
- (xii) Microtubules are involved in chromosomal separation during mitosis. (True/False)

Section-B

Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below.

(3 x 3 = 09)

- (i) Define plasma membrane.
- (ii) What is cell cycle.
- (iii) Write difference between Euchromatin and heterochromatin chromosome.
- (iv) Explain RNA splicing.
- (v) Write the function of Mitochondria.

Section-C

Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below. Question for annotation is compulsory.

(6 x 3 = 18)

- (i) Write about the southern blotting technique.
- (ii) Explain the process of transcription in prokaryotes.
- (iii) Explain numerical changes in chromosomes.
- (iv) Explain apoptosis.
- (v) Write about the Mitochondrial DNA and male sterility.

Section-D

Long answer type questions (word limit – 500-600 words) Attempt any three questions out of five given below.

(11 x 3 = 33)

- (i) Discuss the Gel electrophoresis in detail.
- (ii) Explain the Mitosis cell division in detail ?
- (iii) Explain gene regulation in prokaryotes.
- (iv) Write about the protein sorting in detail ?
- (v) Describe cell cycle and their regulation in detail ?

PGS-251010
Autonomous Examination Dec-2025
SEMESTER-I
M.Sc. (Botany)
Paper – II (Thallophyta)

Time : 3 Hours

M.M. : 70

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

01. Objective type questions Attempt any 12 questions out of 10 given below.
(1 x 10 = 10)

- (i) Edible fungi Agaricus and Plurotus belong to family:-
 - (a) Phycomycetes (b) Ascomycetes
 - (c) Basidiomycetes (d) Deuteromycetes
- (ii) Agar-agar is obtained from Algae :-
 - (a) Gracilaria (b) Brotrachospermum
 - (c) Chara (d) Spirogyra
- (iii) Which Algae of chlorophyceae has Belt Shaped Chloroplast :-
 - (a) Actocarpus (b) Spirogyra
 - (c) Oedogonium (d) Diatoms
- (iv) Isomorphic Alternation of Generation is found in Algae :-
 - (a) Actocarpus (b) Vaucheria
 - (c) Sargassum (d) Oedogonium
- (v) Symbiosis of Algae and Fungi is :-
 - (a) Thallophyta (b) Bryophyta
 - (c) Pteridophyta (d) Lichen
- (vi) Virus is Pandemic pathogen to human Causing Cough and Cold.
- (vii) Yeast (*Saccharomyces Cerevisiae*) is of class of Fungi.
- (viii) Generally, the number of ascospores inside an Ascus is.....
- (ix) Those plants who have not Root, stem leaf system are called
- (x) Algae is used to study Photosynthesis.
- (xi) Unicellular fungi are put in family Mixomycetes. (True/False)
- (xii) Bacteria, Virus, Algae, Fungi are not important for Environment. (True/False)

(02)

Section-B

02. Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below.

(03 x 03= 09)

- 2. Define any three :-
 - (I) What is Thallophyta?
 - (II) Define Gram staining of Bacteria.
 - (III) What do you mean by Puccinia?
 - (IV) Define Lichen.
 - (V) What do you understand by Prokaryote?

Section-C

03. Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below.

(06 x 03= 18)

- 3. Write short note on any three :-
 - (I) Explain the Bacteriophage.
 - (II) Write short notes on Mycorrhiza.
 - (III) Write the characteristics of Heterothallism in the context of fungi.
 - (IV) Write the process of Conjugation in fungi.
 - (V) Write the importance and use of Mushroom.

Section-D

04. Long answer type questions (word limit – 500-600 words) Attempt any three questions out of five given below.

(11 x 03 = 33)

- (i) Describe reproduction in Algae.
- (ii) Explain Progressive reduction of sex in Fungi.
- (iii) Describe Structure and Reproduction of Lichen.
- (iv) Describe economic importance of Bacteria.
- (v) Describe classification of Algae.

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PGS-251011
Autonomous Examination DEC-2025
SEMESTER-I
M.Sc. - Botany

Paper – III (Plant Physiology and Biochemistry)

Time : 3 Hours

M.M. : 70

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

01.Objective type questions Attempt any 10 questions out of 12 given below.
(1 x 10 = 10)

- (i) Which of the following correctly describes a zymogen?
 - (a) coenzyme required for enzyme activity
 - (b) An inactive precursor of an enzyme
 - (c) An enzyme with multiple isoforms
 - (d) A ribonucleic acid acting as a catalyst
- (ii) Water potential in plants is defined as:
 - (a) The rate of diffusion of water across a membrane
 - (b) The capacity of a cell to absorb minerals
 - (c) The difference between free energy of water in a system and pure water
 - (d) The osmotic pressure created by solute concentration only
- (iii) Photorespiration primarily occurs due to the activity of:
 - (a) Cytochrome oxidase
 - (b) RuBisCO acting as an oxygenase
 - (b) (c) PEP carboxylase fixing CO₂
 - (d) NADP-malic enzyme activity
- (iv) Which pathway bypasses the decarboxylation steps of the TCA cycle and helps in lipid mobilization in plants?
 - (a) Pentose phosphate pathway
 - (b) Glyoxylate cycle
 - (c) Fermentation
 - (d) Electron transport chain
- (v) Which plant hormone is primarily associated with stomatal closure during water stress?
 - (a) Auxin
 - (b) Gibberellin
 - (c) Cytokinin
 - (d) Absciscic acid
- (vi) Amino acids are linked together by _____ bonds to form proteins.
- (vii) The difference in free energy that determines the direction of water movement in plants is expressed as _____.

(02)

- (viii) The photosynthetic pathway in which the primary carbon fixation product is oxaloacetate is known as the _____ pathway.
- (ix) During cellular respiration, the cycle that oxidizes acetyl-CoA to CO₂ and generates NADH and FADH₂ is the _____ cycle.
- (x) The plant hormone responsible for seed dormancy and stress responses such as drought tolerance is _____.
- (xi) Isozymes are different enzymes that catalyze different reactions but share identical amino acid sequences. (True/False)
- (xii) Phytochromes, cryptochromes, and phototropins are plant photoreceptors involved in sensing different wavelengths of light and regulating growth responses. (True/False)

Section-B

02. Short answer type questions (word limit 70-100 words) Attempt any Three questions out of Five given below.
(3 x 03= 09)

- (i) What are fat-soluble vitamins? Give the scientific name of fat soluble vitamins.
- (ii) What is root pressure?
- (iii) What is photo-oxidation of water?
- (iv) What is nitrogen fixation name one nitrogen-fixing bacterium.
- (v) What is nastic movement?

Section-C

03. Middle answer type questions (word limit 200–250 words) Attempt any Three questions out of Five given below.
(6 x 03= 18)

- (i) What is enzyme inhibition? Explain competitive and non-competitive inhibition.
- (ii) Write a short note on phloem loading and unloading.
- (iii) What are light-harvesting complexes? Explain their function.
- (iv) Describe the mechanism of nitrogen metabolism in plants.
- (v) Explain the ABC model of floral induction.

(03)

Section-D

04. Long answer type questions (word limit -750 words) Attempt any three questions out of five given below.

(11 x 03 = 33)

- (i) Explain the structure and types of proteins in detail.
- (ii) Describe the mechanisms of water absorption and ascent of sap in plants.
- (iii) Compare the C3, C4 and CAM pathways of carbon assimilation in photosynthesis.
- (iv) Summarize the major steps of plant respiration, including glycolysis, TCA cycle and electron transport.
- (v) How do auxins regulate plant growth, and what are their major functions, with a focus on its canonical signaling?

PGS-251072
Autonomous Examination DEC-2025
SEMESTER-I
M.A./M.Sc./M.Com./LLM
Paper – IV - (Research Methodology & Computer
Application:Basics)

Time : 3 Hours

M.M. : 70

नोट : सभी प्रश्न हल करना अनिवार्य है। प्रश्न के समक्ष अंक एवं शब्द सीमा निर्दिष्ट है।

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

‘खण्ड-अ’

Section-A

1.वस्तुनिष्ठ प्रश्न-दिये गये 12 प्रश्नों में से किन्हीं 10 प्रश्नों के उत्तर दीजिए।

Objective type questions Attempt any 10 questions out of 12 given below.

(01 x 10 = 10)

- (i) निम्न में से कौन सा शोध का अंग नहीं है-
- (अ) परिकल्पना निर्माण (ब) तथ्यों का संकलन
 (स) परिकल्पना का परीक्षण (द) साहित्यिक चोरी
- Which of the following is not a part of research?
- (a) Hypothesis generation (b) Data collection
 (c) Hypothesis testing (d) Plagiarism
- (ii) शोध-नैतिकता में शामिल है-
- (अ) ईमानदारी और सत्यनिष्ठा (ब) पारदर्शिता
 (स) निष्पक्षता (द) उपरोक्त सभी
- Research ethics includes -
- (a) Honesty and Integrity (b) Transparency
 (c) Impartiality (d) All of the above
- (iii) किसी विशिष्ट उद्देश्य के लिए शोधकर्ता द्वारा एकत्र की गई मूल जानकारी कहलाती है-
- (अ) प्राथमिक स्रोत (ब) द्वितीयक स्रोत
 (स) दोनों अ और ब (द) इनमें से कोई नहीं
- Original information collected directly by the researcher for a unique purpose-
- (a) Primary data (b) Secondary data
 (c) Both 'a' & 'b' (d) None of these
- (iv) कंप्यूटर का बाहरी ढांचा कहलाता है-
- (अ) सॉफ्टवेयर (ब) हार्डवेयर
 (स) प्रिंटर (द) इनमें से कोई नहीं

(02)

The outer structure of a computer is called-

- (a) Software (b) Hardware
 (c) Printer (d) None of these

(v) प्रतिचयन का प्रकार है-

- (अ) संभाव्यता प्रतिचयन (ब) गैर-संभाव्यता प्रतिचयन
 (स) दोनों (द) इनमें से कोई नहीं

The type of sampling is-

- (a) Probability sampling (b) Non-probability sampling
 (c) Both (d) None of these

(vi) निम्न में से कौन सा इनपुट उपकरण नहीं है-

- (a) माउस (b) प्रिंटर
 (c) कीबोर्ड (d) स्कैनर

Which of the following is not an input device

- (a) Mouse (b) Printer
 (c) Keyboard (d) Scanner

(vii) एम. एस.पावर प्वाइंट एकसॉफ्टवेयर है।

M.S. Power point is asoftware

(viii) शोध प्रश्न को हल करने के लिए डेटा इकट्ठा करने और उसका

विश्लेषण करने के तरीके कोकहते हैं।

The method of collecting and analyzing data to answer a research question is called

(ix) किसी बड़े समूह से शोध हेतु चुने गये प्रतिनिधिकहलाते हैं।

Representatives selected from a large group for research are called.....

(x) शोध उद्देश्य की पूर्ति हेतु शोध में नैतिकता अत्यंत आवश्यक है। (सत्य/असत्य)

Research Ethics is essential to achieve the research objective.

(True/False)

(xi) साहित्य-समीक्षा शोध का अंग नहीं है।

(सत्य/असत्य)

Literature review is not a part of research.

(True/False)

(xii) गूगल,बिंग,याहू आदि प्रमुख सर्च इंजन हैं।

(सत्य/असत्य)

Google, Bing, Yahoo etc. are the major search engines. (True/False)

(03)

‘खण्ड-ब’

Section-B

2. अति लघुत्तरीय प्रश्न (शब्द सीमा 70–100 शब्द) दिये गये पाँच प्रश्नों में से किन्हीं तीन प्रश्नों के उत्तर दीजिए।

Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below. (3 x 3 = 09)

- (i) शोध के उद्देश्य को स्पष्ट कीजिये |
Explain the purpose of the research.
- (ii) साहित्यिक चोरी से क्या अभिप्राय है?
What is meant by plagiarism?
- (iii) सैम्पल साइज किसे कहते हैं ?
What is sample size?
- (iv) ऑपरेटिंग सिस्टम क्या है ?
What is an operating system?
- (v) शोध-अन्तराल क्या है?
What is Research-Gap?

‘खण्ड-स’

Section-C

3. लघु उत्तरीय प्रश्न (शब्द सीमा 200–250 शब्द) दिये गये पाँच प्रश्नों में से किन्हीं तीन प्रश्नों के उत्तर दीजिए।

Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below. (6 x 3 = 18)

- (i) शोध की परिभाषा लिखिए एवं शोध के विभिन्न चरणों पर प्रकाश डालिए |
Write the definition of research and highlight the various stages of research..
- (ii) साहित्य-समीक्षा से क्या अभिप्राय है? शोध हेतु साहित्य-समीक्षा के महत्व पर प्रकाश डालिए |
What is meant by a literature review? Explain the importance of a literature review for research
- (iii) कंप्यूटर की संरचना का परिचय प्रस्तुत कीजिये |
Give an introduction to the structure of a computer.
- (iv) मात्रात्मक एवं गुणात्मक शोध को उदाहरण सहित परिभाषित कीजिये |
Define quantitative and qualitative research with examples..
- (v) शोध-पत्र प्रकाशन हेतु किन बातों का ध्यान रखा जाना आवश्यक है |
What are the things that need to be kept in mind for publishing a research paper?

(04)

‘खण्ड-द’

Section-D

4. दीर्घोत्तरीय प्रश्न (शब्द सीमा 500–600 शब्द) दिये गये पाँच प्रश्नों में से किन्हीं तीन प्रश्नों के उत्तर दीजिए।

Long answer type questions (word limit – 500-600 words) Attempt any three questions out of five given below. (11 x 03 = 33)

- (i) शोध की विभिन्न पद्धतियों पर प्रकाश डालिए |
Highlight various methods of research.
- (ii) शोध-नैतिकता क्या है? शोध-नैतिकता के वैशिष्ट्य पर प्रकाश डालिए |
What is research ethics? Highlight the salient features of research ethics.
- (iii) शोध-प्रारूप किसे कहते हैं? शोध प्रारूप के विभिन्न अंगों पर प्रकाश डालिए |
What is a research design? Explain the various components of a research design.
- (iv) ‘शोध कार्य में कंप्यूटर की भूमिका’ विषय पर निबंध लिखिए |
Write an essay on the topic ‘Role of computer in research work’.
- (v) शोध के विभिन्न उपकरणों और उनके महत्व पर विस्तृत टिप्पणी कीजिये |
Comment in detail on various tools of research and their importance.

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PGS-251012
Autonomous Examination DEC-2025
SEMESTER –I
M.Sc. - Botany
Paper -V (Environmental Science)

Time: 3 Hours

M.M.: 70

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

**01. Objective type questions Attempt any 10 questions out of 12 given below.
(1 x 10 = 10)**

- (i) Which of these layers of the atmosphere consists of the ozone layer that is responsible for absorbing the Ultra-Violet (UV) light?
(a) Troposphere (b) Mesosphere
(c) Stratosphere (d) None of these
- (ii) What is the estimated percentage of forest land that India should ideally have?
(a) 15% (b) 50%
(c) 44% (d) 33%
- (iii) What is the purpose of Resource Information System (RIS)?
(a) Weather Management (b) Agricultural Management
(c) Oceanography (d) Population Forecasting
- (iv) What function is performed by the data input/capture subsystem of GIS?
(a) Transformation of Data (b) Acquiring Data
(c) Storage of Data Elements (d) Retrieval of Data Elements
- (v) In the tolerance model of succession, what is the relationship between previous and later successional species?
(a) Later species are inhibited by earlier species
(b) Early colonizers are completely superior
(c) Later successional species are neither inhibited nor aided by previous stages
(d) Early colonizers are dependent on later species
- (vi) Which of the following is a key characteristic of an ecade?
(a) The variations are permanent and genetically fixed.
(b) The variations are temporary and environmentally induced.
(c) The organisms belong to different species.
(d) They are the primary producers in an ecosystem.

(02)

- (vii) In an ecosystem, the flow of energy is generally bidirectional (True/ False)
- (viii) Malignant melanoma (skin cancer) is the severe consequence of ozone layer depletion (True/ False)
- (ix) Lichens is a well-known bio-indicator of air pollution (True/ False)
- (x) Final, stable community in an ecological succession is called.....
- (xi) Can be a brackish water ecosystem?
- (xii)is the largest source of commercial energy consumption in the world?

Section-B

**02. Very Short answer type questions (word limit -100 words) Attempt any Three questions out of Five given below.
(3 x 03= 09)**

- (i) What is ecosystem?
- (ii) Name the major ecosystem as well as important vegetation available there of India.
- (iii) What is Atmospheric Ozone? Write the ozone formation process.
- (iv) Define the ecotype and ecade.
- (v) Write the five benefits of using bio-fertilizer

Section-C

**03^v Short answer type questions (word limit –250 words) Attempt any Three questions out of Five given below.
(06x 03= 18)**

- (i) What is environmental stress? Write the management as well.
- (ii) Write the impact of overuse of chemical fertilizer on microbe, plant and animal.
- (iii) Write the Steps of ecological succession.
- (iv) Write about application of GIS.
- (vi) What are natural resources and what would be efficient strategy to manage them?

(03)

Section-D

03. Long answer type questions (word limit -750 words) Attempt any three questions out of five given below.

(11 x 03 = 33)

- (i) Discuss the environmental pollutants.
- (ii) Discuss the different models of succession.
- (iii) What do you understand by biodegradation? Discuss the process of bioremediation.
- (iv) What are the major issues of agriculture and forest? What would be the solution in coming future?
- (v) Discuss the major ecosystem of world in detail.

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