

Day : Saturday
Date : 09/04/2016



Time : 10.00 AM TO 01.00 PM
Max Marks : 80 Total Pages : 1

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the **RIGHT** indicate full marks.
- 4) Draw neat diagrams **WHEREVER** necessary.

SECTION-I

- Q.1** A) Attempt any **ONE** of the following: (06)
- i) Explain semi-conservative mode of replication.
 - ii) Explain in detail mechanism of proof reading in DNA repair.
- B) Attempt any **TWO** of the following: (10)
- i) Explain the action of alkylating agents in DNA damage.
 - ii) Explain in detail DNA polymerase-III with the help of a well labeled diagram.
 - iii) Explain the mechanism of recombination repair mechanism.
- Q.2** Write note on any **FOUR** of the following: (16)
- i) Explain DNA priming reaction.
 - ii) What are Okazaki fragments?
 - iii) Write steps involved in termination of DNA replication in prokaryotes.
 - iv) Explain in brief SOS response.
 - v) Briefly describe replication of telomere.

SECTION-II

- Q.3** A) Attempt any **ONE** of the following: (06)
- i) Explain the steps involved in initiation of transcription in prokaryotes.
 - ii) What are operons? Explain *trp-operon*.
- B) Attempt any **TWO** of the following: (10)
- i) Explain detailed structure of t-RNA and its role in translation.
 - ii) What is elongation complex? Explain steps in elongation of polypeptide in *E.coli*.
 - iii) Explain the structure of RNA polymerase.
- Q.4** Write notes on any **FOUR** of the following: (16)
- i) *Lac operon*
 - ii) Non-sense codon
 - iii) Catabolite repression
 - iv) TATA box
 - v) RNA splicing.
- Q.5** Attempt any **FOUR** of the following: (16)
- i) Role of ribosome in protein synthesis.
 - ii) Explain nick translation.
 - iii) Explain gene regulation in eukaryotes.
 - iv) Explain post-transcriptional modification of m-RNA.
 - v) Explain activator and repressors.

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Subject : Plant Biotechnology

Day : Monday

Date : 11/04/2016



Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 1

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagram **WHEREVER** necessary.
- 4) Both the sections should be written in the **SEPARATE** answer books.

SECTION - I

- Q.1** Attempt any **ONE** of the following: (06)
- a) Define Plant Biotechnology and explain its advantages.
 - b) Describe important milestones in the history of Plant Biotechnology.
- Q.2** Give diagrammatic representation of any **TWO** of the following: (10)
- a) *In vitro* seed germination in dicots.
 - b) Technique of root culture for increase in biomass
 - c) Indirect organogenesis from leaf cultures of legumes.
- Q.3** Briefly describe any **FOUR** of the following: (16)
- a) Types of Plant Growth regulators and their role in PTC
 - b) Components of nutrient medium and their importance for plant cultures.
 - c) Applications of callus culture.
 - d) Method for *in vitro* production of virus free plants
 - e) Advantages of gametoclonal variations

SECTION - II

- Q.4** Attempt any **ONE** of the following: (06)
- a) Describe the techniques for plant transformation.
 - b) Write a note on concerns regarding GM plants.
- Q.5** Answer any **TWO** of the following: (10)
- a) What is hairy root culture? Describe its advantages.
 - b) Enlist different types of molecular markers and explain their applications.
 - c) Describe *in vitro* techniques for crop improvement.
- Q.6** Briefly describe any **FOUR** of the following: (16)
- a) Significance of protoplast culture
 - b) Methods for germplasm conservation
 - c) Importance of Greenhouse in Micropropagation
 - d) Types of plant cell reactors and their application
 - e) Techniques of Artificial seed production
- Q.7** Define all of the following: (16)
- | | |
|----------------------|--------------------------------|
| a) Somatic embryo | e) <i>In vitro</i> pollination |
| b) Dedifferentiation | f) Suspension culture |
| c) Cryopreservation | g) G M Plants |
| d) Elicitors | h) Plant genetic resources |

Subject : Analytical Techniques

Day : Wednesday

Date : 13/04/2016



Time : 10.00 AM TO 01.00 PM

Max Marks : 80 Total Pages : 1

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Both the sections should be written in **SEPARATE** answer books.
- 4) Draw neat labeled diagrams and structures **WHEREVER** necessary.
- 5) Use of non-programmable **CALCULATOR** is allowed.

SECTION - I

- Q.1** a) Attempt any **ONE** of the following: (06)
- i) Describe the various types of centrifuges and their applications in the biochemical industry.
 - ii) Explain the estimation of inorganic phosphate by Bray and Krutz's method. Discuss the advantages and disadvantages of this method.
- b) Attempt any **TWO** of the following: (10)
- i) Discuss the Kjeldahl's method of Nitrogen estimation for soil and water samples.
 - ii) Differentiate between the principle of single and double beam spectrophotometer.
 - iii) Explain the gravimetric estimation of calcium from industrial effluents.
- Q.2** Write short notes on any **FOUR** of the following: (16)
- a) Principle involved in pH meter.
 - b) Modern methods involved in the estimation of minerals.
 - c) Principle of flame photometry
 - d) Titrimetric estimations for purify of water
 - e) Applications of spectrophotometry

SECTION - II

- Q.3** a) Attempt any **ONE** of the following: (06)
- i) Describe in detail the principle of electrophoresis technique in separation of biomolecules. Add a note on the factors affecting the separation during electrophoresis.
 - ii) Discuss the principle and applications of Lyophilization.

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- b) Attempt any **TWO** of the following: (10)
- i) Explain various methods of food preservation.
 - ii) Discuss merits and limitations of filtration technique.
 - iii) Describe the principle and types of Laminar air flow systems.

- Q.4 Write short notes on any **FOUR** of the following: (16)
- a) Nutraceuticals
 - b) 2- D gel electrophoresis
 - c) Different types of chromatography techniques
 - d) Principles of HPLC
 - e) Aseptic methods

- Q.5 Attempt any **EIGHT** of the following: (16)
- a) Role of β – mercaptoethanol and SDS in electrophoresis.
 - b) Difference between analytical and preparatory HPLC technique.
 - c) State Lambert's Beer's Law.
 - d) Why standard buffers are used in pH meter usage.
 - e) Name different types of filtration techniques.
 - f) What are toxic effects of arsenic and fluoride in potable water?
 - g) State two names of ion exchange resins.
 - h) Name two stabilizers and preservatives used in food industry.
 - i) Name any two nutraceuticals with its clinical significance.
 - j) Enumerate various mobile and stationary phases used in thin layer chromatography.

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