

Subject : Molecular Biology - II

Day : Friday

Date : 09/10/2015



Time : 02.00 PM TO 05.00 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 in detail excision mechanism of DNA repair.
 - ii) Explain different types of polymerase in prokaryote.
- B) Attempt any **TWO** of the following: (10)
- i) Describe in detail effect of UV radiation on Genetic material.
 - ii) Describe the mechanism of termination of replication in prokaryotes
 - iii) Write in detail SOS response.
- Q.2** Write note on any **FOUR** of the following: (16)
- i) Describe briefly semi-conservative mechanism of replication.
 - ii) Explain the role of Okazaki fragment in DNA replication
 - iii) Explain in brief mismatch repair mechanism.
 - iv) Briefly describe proof reading mechanism in DNA repair.
 - v) Explain steps involved in DNA priming and write the role of SSB proteins in priming.

SECTION-II

- Q.3** A) Attempt any **ONE** of the following: (06)
- i) Explain in detail the role of DNA polymerase in prokaryotic transcription.
 - ii) Explain in detail the concept of operon with respect to *lac-operon*.
- B) Attempt any **TWO** of the following: (10)
- i) Explain the role of t-RNA in protein synthesis.
 - ii) Explain the mechanism of splicing and its significance.
 - iii) What are transcription factors? Explain its types.
- Q.4** Write notes on any **FOUR** of the following: (16)
- i) Sigma factor
 - ii) Termination factor
 - iii) TATA Binding protein
 - iv) Nick translation
 - v) Enhancers.
- Q.5** Attempt any **FOUR** of the following: (16)
- i) What is holoenzyme?
 - ii) Describe Rho factor.
 - iii) Describe anti-codon.
 - iv) Explain translocation.
 - v) Explain gene regulation in prokaryote.

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Subject : Plant Biotechnology

Day : Saturday

Date : 10/10/2015



Time : 02.00 PM TO 05.00 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) Describe advantages and limitations of Plant Biotechnology.
 - b) Give brief explanation for historical review of Plant Biotechnology.
- Q.2** Give diagrammatic representation of any **TWO** of the following: (10)
- a) Technique of seed culture for seeding development.
 - b) Micropropagation of Banana via axillary shoot proliferation.
 - c) Induction of callus and initiation of suspension culture from root.
- Q.3** Write in brief any **FOUR** of the following: (16)
- a) Sterilization techniques in PTC
 - b) Advantages of meristem culture
 - c) Significance of suspension culture
 - d) Nutrient media composition for tissue culture
 - e) Technique for somatic hybridization
 - f) Applications of somaclonal variations

SECTION - II

- Q.4** Attempt any **ONE** of the following: (06)
- a) Describe the methodology for gene transfer in plants.
 - b) What are GM plants? Explain some of achievements.
- Q.5** Answer any **TWO** of the following: (10)
- a) Discuss various types of cultures for secondary metabolite production.
 - b) What are molecular markers? Explain their importance.
 - c) Describe the technique of endosperm culture and its application.
- Q.6** Briefly describe any **FOUR** of the following: (16)
- a) *In vitro* pollination and fertilization
 - b) Methods for germplasm conservation
 - c) Role of plant cell reactors
 - d) Strategies to optimize secondary metabolite yield
 - e) Commercial applications of Plant Biotechnology
- Q.7** Define all of the following: (16)
- | | |
|--------------------------|-----------------------------|
| a) Growth room | e) Embryo rescue technology |
| b) Totipotency | f) Green-house |
| c) Somatic embryogenesis | g) <i>Agrobacterium</i> |
| d) Artificial seed | h) Transgenic plants |

Subject : Analytical Techniques

Day : Monday

Date : 12/10/2015



Time : 02.00 PM TO 05.00 PM

Max Marks : 80 Total Pages : 2

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 in detail the principle and working of a UV – visible spectrophotometer.
- ii) State the principle of a pH – meter. Add a note on how calibration and maintenance of electrodes is undertaken.

b) Attempt any **TWO** of the following: (10)

- i) Describe the gravimetric estimation of calcium from industrial effluents.
- ii) Explain principle of ultra centrifugation and density gradient centrifugation.
- iii) Describe the titrimetric method for estimation of Arsenic from potable water.

Q.2 Write short notes on any **FOUR** of the following: (16)

- a) Merits and limitations of Flame – photometry
- b) Applications of centrifugation in biochemical industry
- c) Principle of Kjeldahl-method of Nitrogen estimation
- d) Modern methods of estimation of minerals
- e) Advantages and disadvantages of colorimetry

SECTION - II**Q.3 a)** Attempt any **ONE** of the following: (06)

- i) Discuss in detail the concept, principle and procedure of HPLC.
- ii) Explain the principle and types of chromatography.

b) Attempt any **TWO** of the following: (10)

- i) Describe various types of electrophoresis techniques.
- ii) State the applications of laminar air flow systems in biotechnology.
- iii) State the principle and practice of lyophilization.

P.T.O.

- Q.4** Write short notes on any **FOUR** of the following: (16)
- a) Different filtration techniques
 - b) Application of food preservation methods in industry.
 - c) Application of HPLC in research and quality control.
 - d) Factors affecting the separation in electrophoresis
 - e) Applications of chromatography
- Q.5** Attempt any **EIGHT** of the following: (16)
- a) State the role of salt and sugar in food preservation.
 - b) State the role of TEMED in electrophoresis.
 - c) Define 'Mobile phase' and 'Stationary phase'.
 - d) What do you mean by 'Titrimetry'?
 - e) Name 2 lyophilized single cell proteins which are commercially available.
 - f) Define 'Molarity'.
 - g) Which technique is suitable for separation of DNA and RNA?
 - h) Enlist various ion exchange resins.
 - i) Define 'Reverse osmosis'
 - j) State the toxic effects of fluoride and arsenic in potable water.

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