

*M.Sc. Biotechnology*  
Sem - III  
Subject : Environmental Biotechnology

Day : Saturday

Date : 10/10/2015



Time : 02.00 PM TO 05.00 PM

Max Marks : 60 Total Pages : 1.

N. B. :

- 1) Q. No. 1 and Q. No.5 are **COMPULSORY**.
- 2) Attempt **ANY TWO** remaining questions from Section – I and Section – II each.
- 3) Answers to both the sections should be written in the **SEPARATE** answer books.
- 4) Figures to the **RIGHT** indicate full marks.

**SECTION - I**

- Q. 1** Answer **ANY FIVE** of the following questions in brief: (10)
- a) Mention any four methods of water pollution monitoring.
  - b) Differentiate primary and secondary air pollutants.
  - c) What are the effects of noise pollution?
  - d) Write any four sources of soil pollution.
  - e) Enlist various types of reactors used in wastewater treatment.
  - f) How can we detect the micro organisms in the environment?
- Q. 2** Answer the following questions: (10)
- a) Describe the overview drinking water standards in relation to public health.
  - b) What are biosensors? Explain their types and applications.
- Q. 3** Explain the following: (10)
- a) Principles of industrial water treatment.
  - b) Various gases responsible for global warming.
- Q. 4** Write short notes on **ANY TWO** of the following: (10)
- a) Vermicomposting
  - b) Biopesticides and their merits
  - c) Microbes in wastewater treatment

**SECTION - II**

- Q. 5** Answer the following: (10)
- a) What is hazardous waste? Discuss their impact on human health.
  - b) Discuss the significance of techno-economic feasibility of conversion of waste into energy.
- Q. 6** Answer **ANY TWO** of the following: (10)
- a) Define acid rain. Write about the causes and effects of acid rain.
  - b) What is meant by carbon credit? Discuss various methods of carbon crediting.
  - c) Discuss the merits and demerits of bioremediation.
- Q. 7** Write short notes on **ANY TWO** of the following: (10)
- a) Ozone depletion
  - b) Bioaugmentation
- Q. 8** Answer the following: (10)
- a) Define desalination. Mention various techniques used in this process. Add a note on byproducts and industrial applications of desalination.
  - b) What are the global environmental challenges? Mention any four of them with respect to their impacts.

**Subject : Plant Biotechnology**

Day : Monday

Date : 12/10/2015



Time : 02.00 PM TO 05.00 PM

Max Marks : 60 Total Pages : 1

**N.B.:**

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.**
- 2) Answer any **TWO** from Questions 2, 3 and 4 and from 6, 7, & 8.
- 3) Figures to the right indicate **FULL** marks.
- 4) Answers to both the sections should be written in **SEPARATE** answer book.

**SECTION-I**

- Q.1** Explain any **FIVE** of the following questions in brief. **(10)**
- a) Plant Diversity
  - b) Threatened and extinct species
  - c) Biodiversity hot spots of a India
  - d) Techniques for the production of hybrid varieties
  - e) Characterization of biodiversity
  - f) Research areas in plant biotechnology
- Q.2** Answer the following: **(10)**
- a) What are the objectives of modern plant breeding?
  - b) Briefly explain methods of plant breeding in self pollinated plants.
- Q.3** Explain the following: **(10)**
- a) Write a note on selection procedure following hybridization.
  - b) What is marker assisted plant breeding? Discuss its applications.
- Q.4** Write short notes on the following **(10)**
- a) Bioprospecting of plant diversity for product development
  - b) Conservation strategies of plant diversity

**SECTION-II**

- Q.5** Answer the following questions **(10)**
- a) Explain *in vitro* approaches for plant genetic improvement.
  - b) What is present status of plant genetic Engineering?
- Q.6** Answer any **TWO** of the following questions: **(10)**
- a) What are secondary metabolites? Explain their applications.
  - b) Enlist seed industries and plant tissue culture industries in India.
  - c) Describe the applications and advantages of micropropagation.
- Q.7** Write short notes: **(10)**
- a) Ti and Ri plasmids
  - b) Molecular markers and their applications
- Q.8** Answer any **TWO** of the following: **(10)**
- a) Briefly describe Biopesticides and Biofertilizers.
  - b) Give diagrammatic representation of transgenic plant production resistant to pathogen.
  - c) Explain the techniques of micropropagation via somatic embryogenesis.

## Subject : Animal Tissue Culture

Day : Wednesday

Date : 14/10/2015



Time : 02.00 PM TO 05.00 PM

Max Marks : 60 Total Pages : 1

N.B.;

- 1) Q. No. 1 & Q. No. 5 are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from Section – I and any **TWO** questions from Section – II.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Draw well labeled diagrams **WHEREVER** necessary.

## SECTION – I

- Q.1** Answer the following: (10)
- a) What are HEPA filters? What is its role?
  - b) State the role of phenol red in tissue culture medium.
  - c) What is cross contamination?
  - d) What is senescence of a cell line?
  - e) Define density dependent inhibition of mitosis
- Q.2** a) Describe the method of sterilization of: (05)
- i) Heat resistant reagents,
  - ii) Heat sensitive reagents
- b) What are the common microbial contaminations encountered in tissue culture? How are they detected? (05)
- Q.3** a) State the significance of CO<sub>2</sub> incubator. Why animal cell cultures are incubated in it? (05)
- b) Why tissue culture medium is supplemented with serum? (05)
- Q.4** Write short notes on Any **TWO** of the following: (10)
- a) Suspension cultures
  - b) Balanced salt solution
  - c) Organ culture

## SECTION - II

- Q.5** Attempt any **TWO** of the following: (10)
- a) Define primary culture. Outline the steps involved in preparation of primary culture using enzymatic disaggregation.
  - b) Compare the characteristics of normal diploid cell line with continuous cell line
  - c) Define anchorage dependent cells. Describe any one method of their scale up.
- Q.6** a) Describe the method and significance of viable counting (05)
- b) What is microtitration (MTT) assay? For what purpose it is used? (05)
- Q.7** State true or false Giving reasons
- a) Animal tissue culture does not find any application in biotechnology industry (05)
  - b) Stem cells can be used to replace diseased cells in the body (05)
- Q.8** Write short notes on any **TWO** of the following (10)
- a) Nunc cell factory
  - b) Fluidized bed reactor
  - c) Perfused monolayer culture



## Subject : Human Genetics

Day : Friday

Date : 16/10/2015



Time : 02.00 PM TO 05.00 PM

Max Marks : 60 Total Pages : 1

**N.B.:**

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.
- 4) Figures to the right indicate **FULL** marks.

**SECTION - I**

- Q.1** Attempt the following: [10]  
 a) What is a dihybrid cross?  
 b) Define epistasis.  
 c) Define autosomal dominance.  
 d) What is triploidy?  
 e) Define monosomy giving one example.
- Q.2** Attempt the following: [10]  
 a) Explain Mendel's law of segregation.  
 b) Describe 'ABO blood group' system.
- Q.3** Attempt the following: [10]  
 a) Describe the structure and role of Telomere.  
 b) Explain the role of Y chromosome in sex determination.
- Q.4** Write short notes on **ANY TWO** of the following: [10]  
 a) Dosage compensation  
 b) Cystic fibrosis  
 c) Chromosomal banding

**SECTION - II**

- Q.5** Attempt the following: [10]  
 a) Describe numerical chromosomal abnormalities.  
 b) Explain the cause and clinical symptoms of Klienfelter's syndrome.
- Q.6** Attempt the following: [10]  
 a) Describe amniocentesis and state its applications.  
 b) Describe mitochondrial genetic defects.
- Q.7** Write short notes on **ANY TWO** of the following: [10]  
 a) Down's syndrome  
 b) FISH  
 c) Haemophilia
- Q.8** Describe the various types of mutations with illustrations. [10]

**OR**

Explain various inborn errors of amino acid metabolism.

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