Subject : Molecular Biology - II

Day : Monday
Date : 17/10/2016

31431

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) Both the sections to be written on **SEPARATE** answer sheets.

SECTION – I

Q.1 **A)** Answer any **ONE** of the following: **(06)**

a) What are the reasons of DNA damage? Explain base excision repair mechanism in brief

b) Describe the structure and function of DNA polymerase III.

B) Answer any **TWO** of the following: **(10)**

a) Why priming reaction is required to initiate DNA synthesis?

b) What is the role of Lex A protein in DNA repair?

c) Differentiate between prokaryotic and eukaryotic DNA replication.

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

a) Mismatch repair

b) Okazaki fragments

c) Photoreactivation

d) DNA Microsatellites

e) Nucleosome replication

SECTION – II

Q.3 **A)** Answer any **ONE** of the following: **(06)**

a) Give an outline on the steps involved in elongation during protein synthesis.

b) Explain the structure and function of prokaryotic RNA polymerase enzyme.

B) Answer any **TWO** of the following: **(10)**

a) Explain tryptophan operon

b) Discuss the role of Sigma factor in prokaryotic transcription.

c) Describe post transcriptional modifications of t RNA.

Q.4 Answer any **FOUR** of the following: **(16)**

a) Why t RNA is called adaptor molecule?

b) Differentiate between prokaryotic and eukaryotic ribosomes.

c) What are promoter and enhancer sequences?

d) What is the role of Initiation factors is bacterial protein synthesis?

e) What are structural and regulator genes?

Q.5 Write short notes on any **FOUR** of the following : **(16)**

a) m RNA Splicing

b) Transcription bubble

c) TATA Box

d) Cis acting element

e) Rho factor

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Subject : Plant Biotechnology

Day : Wednesday
Date : 19/10/2016

31432

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) Answer to both the sections should be written in **SEPARATE** answer book.
4) Draw neat labeled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 A) Answer any **ONE** of the following: **(06)**

i) What is micropropagation? Explain its advantages and limitations.
ii) Write types of sterilization techniques.
iii) Discuss scope of Plant Biotechnology.

B) Give diagrammatic representation of any **TWO** of the following: **(10)**

i) Steps involved in somatic embryogenesis.
ii) Chloroplast transformation.
iii) Apical bud culture for virus free plants.

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

a) What are the concerns regarding GM plants?
b) Explain embryo rescue technology.
c) Write a note on germplasm preservation.
d) Enlist the components of defined nutrient media in PTC.
e) Give various types of *in vitro* cultures.

SECTION-II

Q.3 A) Answer any **ONE** of the following: **(06)**

i) What is organogenesis? Describe indirect organogenesis.
ii) Write a note on selection of transformants.

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

i) Explain importance of green house in PTC.
ii) Write on strategies for enhancing secondary metabolite production.
iii) Discuss DNA finger printing.

Q.4 Attempt any **FOUR** of the following: **(16)**

a) Explain selectable markers with suitable examples.
b) How to check genetic stability of *in vitro* cultured plants?
c) Write about gene silencing for crop improvement.
d) Elaborate on microspore culture.
e) What are artificial seeds? Describe their applications.

Q.5 Write short notes on any **FOUR** of the following: **(16)**

a) Gametogenesis
b) Elicitors for secondary metabolite production
c) Immobilization of cultures
d) Dedifferentiation
e) Aseptic conditions
f) Inoculation
g) Micrografting
h) Molecular markers

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Subject : Analytical Techniques

Day : Friday
Date : 21/10/2016

31433

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) Answers to both the sections should be written in **SEPARATE** answer books.
4) Draw neat structures and diagrams **WHEREVER** necessary.

SECTION – I

Q.1 **A)** Attempt any **ONE** of the following: **(06)**
i) Describe the principle of pH meter. Draw the schematic diagram of the pH electrode showing different parts.
ii) Explain the estimation of inorganic phosphate Bray and Krutz method. Discuss its advantages and disadvantages.

B) Attempt any **TWO** of the following: **(10)**
i) Discuss the single and double beam UV-visible spectrophotometer with neat and labeled diagram.
ii) Explain the gravimetric estimation of calcium from industrial effluent.
iii) What is tritrimetry? What are the toxic effects of fluoride, chloride, sulphate and arsenic from potable water?

Q.2 Attempt any **FOUR** of the following: **(16)**
a) Explain the care involved in handling of pH electrode.
b) Discuss the merits and limitations of flame photometry.
c) Describe the estimation of purines and pyrimidines.
d) Add a note on Kjeldahls method of nitrogen estimation.
e) Explain the Beert Lambert's law in detail with schematic diagram.

SECTION – II

Q.3 **A)** Attempt any **ONE** of the following: **(06)**
i) Explain the principle of Laminar Air Flow.
ii) What is density gradient centrifugation? Describe the applications of centrifugation in biotechnology industry.

B) Attempt any **TWO** of the following: **(10)**
i) Enlist various filtration techniques. Write an exhaustive note on reverse osmosis.
ii) Differentiate between thin layer chromatography and ion exchange chromatography.
iii) Describe in detail any two methods of food preservation.

Q.4 Write short notes on any **FOUR** of the following: **(16)**
a) Types of electrophoresis
b) Streptomycin purification
c) Applications of lyophilization in R & D industry
d) Nurtraceuticals
e) Ultrafiltration

Q.5 Answer any **EIGHT** in one or two sentences. **(16)**
a) How will you differentiate between analytical and preparatory HPLC?
b) Give names of two nutraceuticals with their clinical significance.
c) How much sodium chloride (NaCl) is required for preparing 100 ml of 5 ppm solution? (M.W. of NaCl = 58.46, Na = 23.0)
d) Define – i) molarity ii) normality
e) Explain the role of SDS and β-mercaptoethanol in electrophoresis.
f) Draw schematic diagram related to different parts of HPLC.
g) Name any two stabilizers and preservatives in food industry.
h) Explain technique for separation of RNA and DNA with justification.
i) Name strong cation exchanger and a strong anion exchanger resin.

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