HSC Maharashtra Board question paper - March 2013

Note:

i. Answers to Section-I and Section-II should be written in **Two Separate** answer books.
ii. Questions from Section-I attempted in the answer book of Section-II and vice-versa will not be assessed / not given any credit.
iii. All questions are compulsory.
iv. Draw neat and labelled diagram wherever necessary.
v. Figures to the right indicate full marks.
vi. Answer to every new question must begin on a new page.

BOTANY: SECTION – I

Q.1. Select and write the most appropriate answer from the given alternatives for each sub-question: [7]

i. The pattern of ecosystem in which density and distribution of species vary along a horizontal gradient is _____.
(A) zonation
(B) stratification
(C) ecological niche
(D) speciation

ii. The enzyme affecting the shelf life of flavr savr tomato is _____.
(A) galactosidase
(B) trans acetylase
(C) permease
(D) polygalactouranase

iii. In nomenclature of RENs (restriction endo-nucleases) Hind III, III stands for _____.
(A) genus name
(B) species name
(C) order of discovery
(D) strain of the organism

iv. *Rhizobium phaseoli* fixes atmospheric nitrogen symbiotically in _____.
(A) pea (B) bean
(C) jowar (D) maize

v. In nucleotide, the nitrogen base is attached to carbon no.1 of sugar by _____ bond.
(A) glycosidic (B) hydrogen
(C) phosphodiester (D) phosphate

vi. During biogas production microorganism used to bring about the anaerobic digestion is _____.
(A) *Pseudomonas* (B) *Rhizopus*
(C) *Methanococcus* (D) *Methanobacillus*

vii. A wheat variety resistant to hill bunt disease is _____.
(A) Pusa Shubhra (B) Himgiri
(C) Pusa Gaurav (D) Pusa Sawani

Q.2. (A) Answer in One sentence each: (6) **[12]**

1. Define the term 'leaching'.
2. Give reason –
   'Buttermilk is used in the dough of dhokla.'
3. What is palindrome in DNA?
4. What is biomagnification?
5. Give application of mutation breeding.
6. What will be the length of eukaryotic DNA segment having 10 pairs of nucleotides?

(B) Draw a neat labelled diagram of the hair pin model of t-RNA. (2)

(C) Attempt Any TWO of the following: (4)

1. Give schematic representation of carbon cycle.
2. What is respiratory quotient (RQ)? Why RQ in anaerobic respiration is infinite?
3. Explain the structure of male gametophyte of angiosperms with the help of a suitable diagram.
4. Explain how suspension culture is prepared from callus.

Q.3. (A) Attempt any TWO of the following: (6) **[9]**

1. What are biocontrol agents? Mention any two groups of biocontrol agents and their hosts.
2. 'In incomplete dominance and co-dominance, genotypic and phenotypic ratios are identical.' Explain how co-dominance differs from incomplete dominance in phenotypic nature of their hybrids.
3. Describe characteristics of genetic code.

(B) Draw a neat labelled diagram showing steps of PCR. (3)

Q.4. Describe the ultrastructure of chloroplast. Add a note on the significance of photosynthesis. [7]

OR

Define geitonogamy and xenogamy. Give advantages of self pollination and cross pollination. Explain how dichogamy favours cross pollination.