BIOLOGY I (THEORY)

STD12 **Second Prelim examination 2015-2016** (***Three hours***)

Answer all questions in Part I and six questions in Part II, choosing two questions from each of the three sections A, B and C.

The intended marks for questions or parts of questions are given in brackets [].

Part II each point carries half mark.

Part I

Answer **all** questions

Question 1

A. Answer briefly **[4]**

1. What is cognogeny?
2. State a benefit of dendrochronology.
3. What is the importance of cohesion in ascent of sap?
4. Give two applications of MRI.

B. Give a scientific term for **[4]**

1. The process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology
2. The peripheral waterproof tissue formed in mature woody stems due to activity of cork cambium.
3. The primitive ovary with funicle, chalaza and micropyle in one vertical line.
4. Method of making multiple copies of gene of interest *in vitro*.

C. Give the contribution of. **[4]**

1. Spallanzani
2. Decker
3. Gustafson
4. H.G. Khorana

D. Elaborate the following: **[4]**

1. IUCD
2. IPM
3. YAC
4. SSBP

E. Choose the correct option (copy and write the answer with the alphabet): **[4]**

1. What is the energy absorbed by chlorophyll used directly for in plants?

   I. To produce ATP

   II. To split water

   III. To fix CO2

   A. I only

   B. III only

   C. I and II only

   D. II and III only

2. When genes are transferred between species, the amino acid sequence of the polypeptide translated from them is unchanged. Why is this so?
   A. All organisms use ribosomes for protein synthesis.
   B. DNA replication is semi-conservative.
   C. The enzymes used are substrate specific.
   D. The genetic code is universal.

3. What are antibodies?
   A. Organisms or viruses that cause disease
   B. Drugs used to treat bacterial diseases
   C. Substances the body recognizes as foreign
   D. Proteins that bind to foreign substances

4. The concentration of which hormone peaks sharply triggering ovulation?
   A. FSH
   B. LH
   C. Estrogen
   D. Progesterone

Part II
Section A

Answer any **two** *questions*

Question 2

a. What are molecular evidences of evolution? Give examples. [2]
b. Differentiate between abiogenesis and biogenesis. [1]
c. Explain natural selection on the basis of DDT resistance in mosquitoes. [3]

Question 3

a. State a similarity and a difference between living organisms and non-living objects on the basis of level of organization. [1]
b. Describe two characters that have developed during human evolution. [2]
c. Explain the types of gene mutation. [2]

Question 4

a. *Arcabeopteryx lithographica* is a missing link between reptiles and birds. Explain. [2]
b. Give three examples favoring criticism of Lamarckism. [3]

SECTION B

Answer any **two** *questions*

Question 5

a. Give one main difference between- [2]
   i. Exarch and endarch xylem
   ii. Heart wood and sap wood
b. State two significances of seed and fruit formation. [2]
c. Explain the mass flow hypothesis with a diagram. [3]
d. What are assisted reproductive technologies? Explain two of these. [3]

Question 6

a. Draw the L.S. of an anatropous ovule. [3]
b. RuBP *carboxylase* acts a RuBP *oxygenase*. Explain the statement. [1]
c. What is amniocentesis? Discuss its role in detecting genetic disorders. [2]
d. Draw the Z scheme of photophosphorylation. [4]

Question 7

a. Draw the internal structure of ovary. [3]
b. Discuss the changes occurring in the ovule and ovary during seed formation. [3]
c. Discuss the contrivances for prevention of self-pollination. [2]
d. Describe in brief the changes the zygote undergoes up to implantation. [2]

SECTION C

Answer any **two** *questions*

Question 8

a. Discuss in brief the applications and the ethical issues of DNA fingerprinting. [3]
b. Differentiate between B and T cells in terms of their mechanism of action. [4]
c. Define allergy and give its general symptoms. [3]

Question 9

a. State Mendel's principles of inheritance. [3]
b. Describe three interactions of the biotic community. [3]
c. Describe the role of enzymes in DNA replication. [4]

Question 10

a. Discuss the role of bacteria and cyanobacteria in improving soil fertility. [2]
b. Write a brief note on- [2]
   i. Hot spots
   ii. Red data book
c. Mention the applications of recombinant DNA technology in human health. [3]
d. What is criss cross inheritance? Explain with example. [3]