BIOLOGY

MAHENDRA TUTORIALS

Time : 3 Hrs. **Max. Marks :** 70

Note : (1) All questions are compulsory.

(2) Answers to the question in Section - I and Section - II should be written in TWO separate answer books.

(3) Questions from Section - I attempted in the answer book of Section - II and vice-versa will not be assessed / not given any credit.

(4) Draw neat and well labelled diagrams wherever necessary.

(5) Figures to the right indicate full marks.

(6) Answer to every new question must be started on a new page.

SECTION - I BOTANY

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

(i) The biological scissors is _____.

(a) restriction endonuclease (b) gyrase

(c) DNA ligase (d) helicase

(ii) Dead and dried cell mass of microbes having nutritive value is also known as _____.

(a) BGA (blue-green algae)

(b) SCP (single cell protein)

(c) STP (sewage treatment plant)

(d) VAM (vesicular arbuscular mycorrhizae)

(iii) From the visible spectrum of light, which component is reflected by the green leaves ?

(a) Blue (b) Red (c) Green (d) Orange

(iv) For formation of 50 seeds, how many minimum meiotic divisions are necessary ?

(a) 25 (b) 50 (c) 75 (d) 63

(v) In bisexual flowers, maturation of gynoecium before androecium is known as _____.

(a) protandry (b) protogyny (c) gynandry (d) dicliny

(vi) The permanent removal of forests and woodlands is called _____.
(a) reforestation (b) afforestation (c) deforestation (d) agroforestry

(vii) Abundance of phosphate, causing algal overgrowth resulting in depletion of oxygen and killing other aquatic life is known as _____.
(a) ecological succession (b) eutrophication
(c) guano deposits (d) greenhouse effect

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

(i) What are 'jumping genes' ?
(ii) Give the importance of heterocyst in cyanobacteria.
(iii) From which microbial source can pectinase be obtained ?
(iv) Which is the ultimate pathway for fixing carbon dioxide (CO_2) into glucose ?
(v) Name the process of respiration which does not involve intake of oxygen (O_2) and release of carbon dioxide (CO_2).
(vi) What is 'biomagnification'?

Q. 2.(B) Sketch and label 'clover leaf model' of t-RNA. (2)

Q. 2.(C) Attempt any TWO of the following : (4)

(i) 'There is a hole in the ozone layer'. What do you understand by this ?
(ii) Name any 'two' edible varieties of mushrooms. Give nutritional values of these mushrooms.
(iii) With the help of diagrams, describe emasculation and bagging.
(iv) What is 'biopatent' ? Give any 'two' examples.

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

(i) Describe any 'two' applications of tissue culture technique.
(ii) What is 'photorespiration' ? Explain it with diagrammatic representation.
(iii) Describe the experiment of Hershey and Chase to prove that DNA is the genetic material.

Q. 3.(B) Sketch and label 'ultrastructure of mitochondrion'. (3)

Q. 4. What is 'double fertilization'? Describe it with the help of a neat and well labelled diagram. Give its importance. **[7]**

OR

Q. 4. State and explain the 'Law of Independent Assortment' with a suitable example. **[7]**

SECTION - II ZOOLOGY

Q. 5. Select and write the most appropriate answer from the given alternatives for each sub-question : **[7]**

(i) The most common types of fossils are _____.
(a) moulds (b) casts (c) actual remains (d) models

(ii) Which of the following traits is never observed in human females ?
(a) Hypertrichosis (b) Haemophilia (c) Colour blindness (d) Myopia

(iii) Safety of polio vaccine is tested on transgenic _____.
(a) pig (b) rabbit (c) fish (d) mice

(iv) Mucous membrane trapping the microbes acts as a _____.
(a) physiological barrier (b) physical barrier

(c) phagocytic barrier (d) inflammatory barrier

(v) Conversion of ammonia into uric acid occurs through _____.
(a) ornithine cycle (b) guanine cycle
(c) Ionosinic pathway (d) Kreb's cycle

(vi) Spinal cord and sympathetic ganglion of autonomous nervous system are connected by _____.
(a) ramus ventralis (b) ramus communicans
(c) ramus dorsalis (d) connective

(vii) Pregnancy in second trimester is maintained by _____.
(a) LH (lutenizing hormone) (b) progesterone
(c) estrogen (d) HCG (human chorionic gonadotropin)

Q. 6.(A) Answer the following in 'one' sentence each : (6) **[12]**

(i) What is 'gene flow' ?
(ii) Why do sex linked traits appear more in males than in females ?
(iii) What is 'restriction digestion' ?
(iv) What is the use of tissue plasminogen activator ?
(v) Name the type of animal breeding carried out to produce a mule.
(vi) Why is zona pellucida retained around the egg till it reaches uterus ?

Q. 6.(B) Draw a neat and well labelled diagram of human excretory system. (2)

Q. 6.(C) Attempt any TWO of the following : (4)

(i) Write a note on desert adaptations.

(ii) Give the economic importance of fisheries.

(iii) Distinguish between X and Y chromosomes.

(iv) Give applications of a vaccine.

Q. 7.(A) Attempt any TWO of the following : (6) **[9]**

(i) With the help of a chart, explain the method of sex determination in honeybees.
(ii) Describe the structure of an antibody.
(iii) Distinguish between the following :
(Give at least one point of distinction for each pair.)
(a) Natality and Mortality
(b) Competition and Mutualism
(c) Agricultural water pollution and Shipping water pollution.

Q. 7.(B) Sketch and label V. S. of human eye. (3)

Q. 8. Draw a neat and well labelled diagram showing T. S. of ovary and describe the menstrual cycle in human female. **[7]**

OR

Q. 8. With the help of a well labelled diagram describe the internal structure of human heart **[7]**