SECTION – I
[BOTANY]

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

i. Genotype of human blood group ‘O’ will be __________.
   (A) I^A I^B
   (B) I^A i
   (C) i
   (D) I^A i

ii. ‘Cry’ genes are present in __________.
    (A) Agrobacterium tumefaciens
    (B) Bacillus thuringiensis
    (C) Rhizobium species
    (D) Escherichia coli

iii. ‘Tropane’ is obtained from __________.
     (A) Daucus carota
     (B) Catharanthus roseus
     (C) Datura stramonium
     (D) Mentha piperata

iv. Which of the following vitamins is not fat soluble?
    (A) Vitamin A
    (B) Vitamin B
    (C) Vitamin D
    (D) Vitamin K

v. How many meiotic divisions are required to produce 200 seeds?
   (A) 50
   (B) 100
   (C) 200
   (D) 250

vi. Energy flow in ecosystem is __________.
    (A) reverse
    (B) unidirectional
    (C) bidirectional
    (D) multidirectional

vii. Endosperm of angiosperm is __________.
     (A) haploid
     (B) diploid
     (C) triploid
     (D) tetraploid

Q.2. (A) Answer in ‘One’ sentence only:

i. What is Bacteriophage?
ii. What is emasculation?
iii. What is VAM?
iv. What is the role of decomposers in an ecosystem?
v. Name any two edible mushrooms.
vi. What is ecological succession?
(B) Sketch and label the ‘Ultrastructure of Mitochondrion’.

(C) Answer the following (Any TWO):
   i. Give the floral adaptations for anemophily.
   ii. Name any two antibiotics with their microbial source.
   iii. Describe the formation of helobial endosperm.
   iv. Give the hazardous effects of agrochemicals.

Q.3. (A) Answer the following (Any TWO):
   i. Explain incomplete dominance with suitable example.
   ii. What are transgenic plants? Explain with any two examples.
   iii. Explain micropropagation and somatic hybridization.
   (B) Sketch and label stages in development of angiospermic female gametophyte from functional megaspore.


OR

What is dark reaction in photosynthesis? Describe $C_3$ Pathway.

SECTION – II

[ZOOLGY]

Q.5. Select and write the most appropriate answer from the given alternatives for each sub-question:
   i. Vermiform appendix is an example of ________ organ.
      (A) vestigeal (B) homologous (C) sense (D) analogous
   ii. In which of the following disorders number of chromosomes present is 47?
      (A) Turner’s syndrome (B) Cushing’s syndrome (C) Acquired Immuno - Deficiency Syndrome (D) Down’s syndrome
   iii. Human blood clotting factor VIII is used to treat ________.
      (A) pituitary dwarfism (B) diabetes mellitus (C) haemophiliacs (D) cystic fibrosis
   iv. A person suffering from diabetes insipidus shows ________.
      (A) hyperglycemia (B) hypoglycemia (C) polyuria (D) hypertension
   v. Photoreceptor cells are present in ________.
      (A) blind spot (B) retina (C) cochlea (D) cornea
   vi. ‘HAART’ is suggested for the treatment of ________.
      (A) malaria (B) cancer (C) AIDS (D) high cholesterol level
   vii. For DNA fingerprinting radioactive probe obtained from ________ is used in India.
      (A) Banded Krait (B) King Cobra (C) Viper (D) Rat snake
Q.6. (A) **Answer in ‘One’ sentence each:**

i. Give any two examples of commensalism.
ii. What is the common name of *Apis mellifera*?
iii. Which growth hormone is used to enhance dairy productivity?
iv. Define Linkage.
v. Name of two classes to which *Archaeopteryx* acts as connecting link.
vi. Define the term natality.

(B) Sketch and label Malpighian body.

(C) **Attempt any TWO of the following:**

i. Enlist any four sequential evolutionary names of human ancestors.
ii. Give the significance of transgenic animals for betterment of life.
iii. Give the economic importance of lac.
iv. Give the fate of mesoderm.

Q.7. (A) **Attempt any TWO of the following:**

i. Explain the mechanism of sex determination in birds.
ii. Give any two unique features of acquired immunity.
iii. With the help of pyramid, describe the growing population.

(B) Sketch and label reflex arc.

Q.8. Explain the process of early cleavage till the formation of morula.  

OR

Describe five types of leucocytes, with the help of diagrams. Add a note on their functions.