

# BOARD QUESTION PAPER : MARCH 2015

## BIOLOGY

Time: 3 Hours

Total Marks: 70

**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.

### SECTION – I

#### [BOTANY]

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

[7]

- i. A cross used to verify the unknown genotype of  $F_1$  hybrid is a \_\_\_\_\_ cross.  
(A) test (B) back  
(C) dihybrid (D) monohybrid
- ii. Appearance of new combinations in  $F_2$  generation in a dihybrid cross proves the law of \_\_\_\_\_.  
(A) dominance (B) segregation  
(C) independent assortment (D) purity of gametes
- iii. A fine powder of recycled modified plastic is known as \_\_\_\_\_.  
(A) polyblend (B) polythene  
(C) polyester (D) polymer
- iv. The partially decomposed organic matter is formed by a process called \_\_\_\_\_.  
(A) fragmentation (B) humification  
(C) mineralization (D) leaching
- v. Transfer of genetic material into a bacterial cell through a viral vector is known as \_\_\_\_\_.  
(A) transformation (B) transduction  
(C) transfection (D) translation
- vi. If the number of chromosomes in an endosperm cell is 27, what will be the chromosome number in the definitive nucleus?  
(A) 9 (B) 18  
(C) 27 (D) 36
- vii. Lever mechanism of pollination is observed in \_\_\_\_\_.  
(A) *Salvia* (B) *Jasmine*  
(C) *Bougainvillea* (D) *Butea*

**Q.2. (A) Answer each question in 'One' sentence:**

(6)[12]

- i. A pea plant pure for yellow seed colour is crossed with a pea plant pure for green seed colour. In  $F_1$  generation, all pea plants were with yellow seed. Which law of Mendel is applicable?
- ii. Name the enzyme responsible for delay in ripening of tomato fruit.
- iii. Which are the bacteria responsible for converting organic acids into methane?

- iv. Name the high yielding semi-dwarf varieties of wheat selected and introduced in India in 1963.
- v. 'Formation of primary endosperm nucleus is called triple fusion'. Give reason.
- vi. Mention any 'two' ecological services for the benefit of mankind.

**(B) Sketch and label 'tubular tower fermenter'.** (2)

**(C) Answer the following (Any TWO):** (4)

- i. Global warming is caused by 'greenhouse effect'. Justify.
- ii. With the help of a neat and labelled diagram explain VAM (vesicular arbuscular mycorrhizae).
- iii. Distinguish between light and dark reactions.
- iv. 'Mendel selected the garden pea plants for his experiments'. Explain.

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

- i. With the help of a neat and labelled diagram describe steps in recombinant DNA technology.
- ii. What is 'tissue culture'? Describe the methodology of tissue culture.
- iii. Define vegetative propagation. Differentiate between 'stem tuber' and 'tuberous root'.

**(B) Sketch and label T.S. of angiospermic anther.** (3)

**Q.4.** With the help of a neat and labelled diagram describe Watson and Crick's model of DNA. [7]

**OR**

With the help of schematic representation explain Krebs's cycle.

## SECTION – II

### [ZOOLOGY]

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

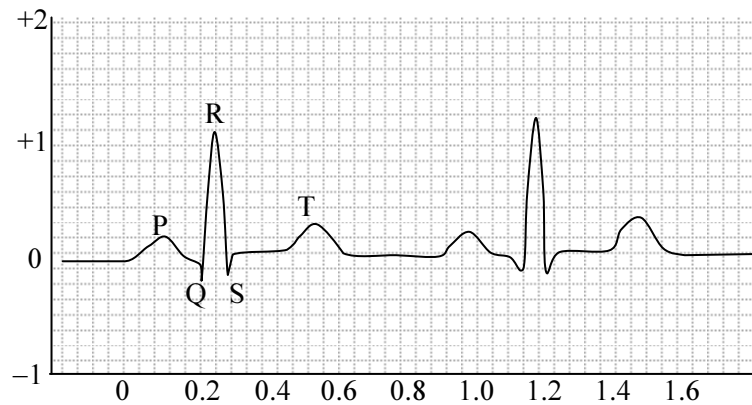
- i. In gene therapy, DNase is used to treat \_\_\_\_\_.
  - (A) cystic fibrosis
  - (B) haemophilia
  - (C) pituitary dwarfism
  - (D) insulin dependent diabetes
- ii. If only one 'X' chromosome is found in a female person, which of the following symptoms she will show?
  - (A) epicanthal skin fold
  - (B) webbing of neck
  - (C) small testis and absence of spermatogenesis
  - (D) presence of simian crease on the palm
- iii. In which of the following haploid cells a whole genome in human being is present?
  - (A) sperm
  - (B) somatic cell
  - (C) mature RBC
  - (D) primary spermatocyte
- iv. Which of the following is NOT an example of connecting link?
  - (A) *Archaeopteryx*
  - (B) *Ichthyostegia*
  - (C) *Seymouria*
  - (D) *Biston betularia*
- v. In \_\_\_\_\_, superior males of the one breed are mated with superior females of another breed.
  - (A) outcrossing
  - (B) cross-breeding
  - (C) outbreeding
  - (D) inbreeding
- vi. Normal activities of the heart are regulated by \_\_\_\_\_.
  - (A) brain
  - (B) spinal cord
  - (C) modified cardiac muscles
  - (D) hormones

- vii. During \_\_\_\_\_ type of interaction, both organism are benefited.  
 (A) mutualism (B) competition  
 (C) commensalism (D) parasitism

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

**(6)[12]**

- What is gene pool?
- Give any 'two' names of X-linked diseases.
- What does abbreviation HGP stand for?
- Give 'two' varieties of silk which are considered as inferior quality.
- In the electrocardiogram shown below, which wave represents ventricular diastole.



- vi. Which method of conservation of biodiversity includes 'hot spot' method?

**(B) Sketch and label ventral view of human heart.**

**(2)**

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

**(4)**

- Distinguish between ape and man.
- Give the applications of DNA fingerprinting technique.
- Enlist the various types of cancer.
- Give the significance of fertilization.

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

**(6)[9]**

- What will be phenotype of progeny, if a carrier haemophilic female marries a normal male? Explain.
- With the help of a chart, explain the compatibility of human blood groups.
- Justify the following sentences:
  - The conservation of endangered species of plants and animals is necessary.
  - Pollution Under Control (PUC) certificate is mandatory for all vehicles and industries.

**(B) Sketch and label 'structure of nephron'.**

**(3)**

**Q.8.** With the help of a labelled diagram of lateral view of cerebrum, describe its structure and give any 'two' functions of cerebrum.

**[7]**

**OR**

With the help of a neat, labelled diagram, describe the human male reproductive system.