

Maharashtra State Board (MSBSHSE)

H.S.C 2014 - 2015 March

12th Board Exam

Biology

www.shaalaa.com

General Instructions:

1. All questions are compulsory.
2. Answers to the questions 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 be given any credit.
4. Draw neat and 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 alternative for each sub-question: [7]

- (i) A cross used to verify the unknown genotype of F₁ hybrid is a _____ cross.
(a) test
(b) back
(c) dihybrid
(d) monohybrid
- (ii) Appearance of new combinations in F₂ 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) mineralisation
 - (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.

[12]

(A) Answer each question in 'one' sentence only.

(6)

- (i) A pea plant pure for yellow seed colour is crossed with a pea plant pure for green seed colour. In F₁ generation all pea plants were with yellow seeds. 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) Attempt any TWO of the following: **(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. **[9]**

(A) Attempt any TWO of the following: **(6)**

- (i) With the help of a neat and labelled diagram describe the 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 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, DNAase 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 one breed are mated with superior females of another breed.
- (a) out crossing
 - (b) cross breeding
 - (c) out breeding
 - (d) in breeding
- (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 organisms are benefited
- (a) mutualism
 - (b) competition
 - (c) commensalism
 - (d) parasitism

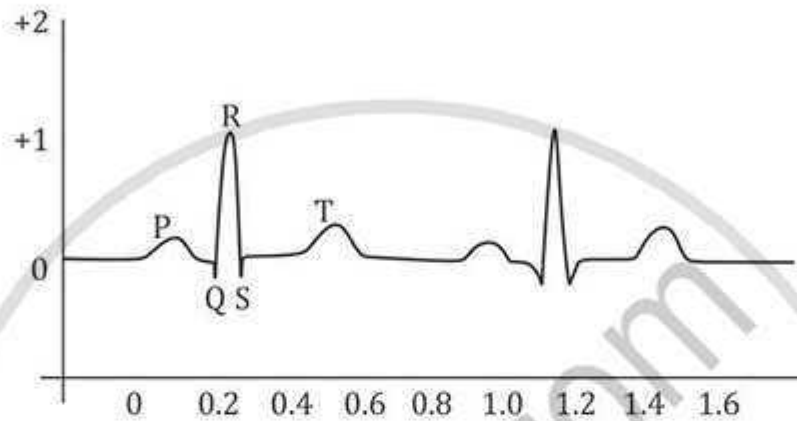
Q. 6.

[12]

(A) Answer the following in 'one' sentence each:

(6)

- (i) What is gene pool?
- (ii) Give any 'two' names of X-linked diseases.
- (iii) What does abbreviation HGP stand for?
- (iv) Give 'two' varieties of silk which are considered as inferior quality.
- (v) 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)

- (i) Distinguish between ape and man.
- (ii) Give the applications of DNA fingerprinting technique.
- (iii) Explain the various types of cancer
- (iv) Give the significance of fertilisation.

Q. 7.

[9]

(A) Attempt any TWO of the following.

(6)

- (i) What will be the phenotype of progeny, if a carrier haemophilic female marries a normal male? Explain.
- (ii) With the help of a chart, explain the compatibility of human blood groups.
- (iii) Justify the following sentences:
 - (a) The conservation of endangered species of plants and animals is necessary.
 - (b) 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 the structure and give any 'two' functions of cerebrum. [7]

OR

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

