

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 :

- (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) 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 in ‘one’ sentence each :

(6) [12]

- (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.

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

(2)

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

(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'.

Q. 3.(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

OR

Q. 4. With the help of schematic representation explain Kreb's cycle.

[7]

SECTION - II

ZOOLOGY

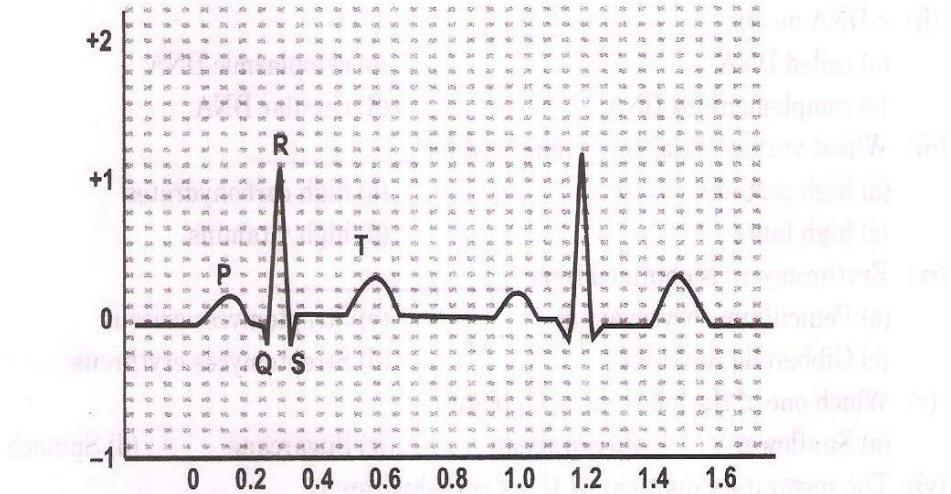
Q. 5. Select and write the most appropriate answer from the given alternatives for each sub-question :

[7]

- (vii) During _____ type of interaction, both organisms are benefited
 (a) mutualism (b) competition (c) commensalism (d) parasitism

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

- (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 ?

Q. 6.(B) Sketch and label ventral view of human heart. (2)

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

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

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

- (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.

Q. 7.(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

Q. 8. With the help of a neat, labelled diagram, describe the human male reproductive system.