

DAY — **11**

SEAT NUMBER

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2015 III 09

1100

J - 188

(E)

BIOLOGY (56)
(GENERAL BOTANY AND ZOOLOGY)

Time : 3 Hrs.

(7 Pages)

Max. Marks : 70

- Note :** (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 alternatives 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) 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 only : (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.

(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. (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'.

(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 Kreb's cycle.

SECTION – II

[ZOOLOGY]

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

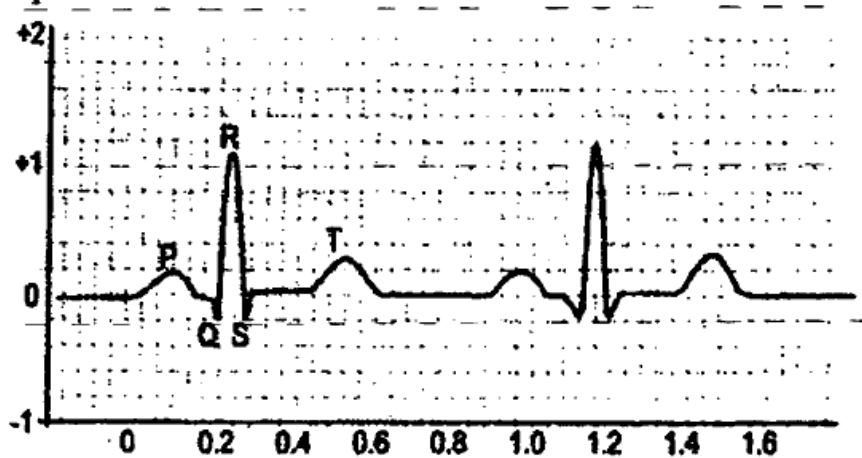
- (i) In gene therapy, DNAase is used to treat _____.
 - (a) cystic fibrosis
 - (b) haemophilia
 - (c) pituitary dwarfism
 - (d) insulin dependent diabetes

- (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? <https://www.maharashtrastudy.com>
- (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. (A) Answer the following 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?

(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) 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.

(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.

