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 methodolgy 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, 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]

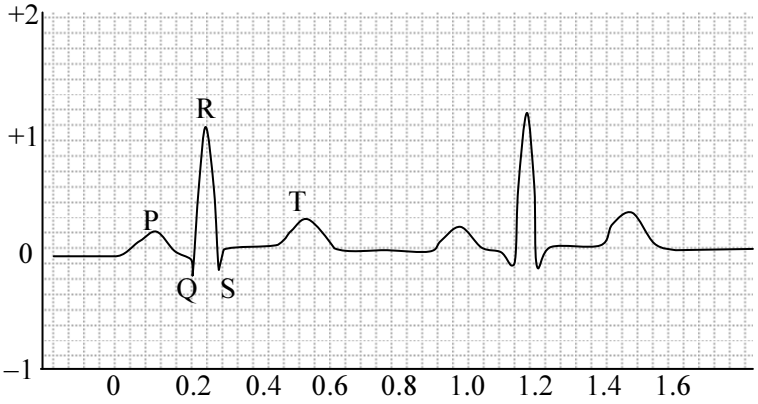
i. What is gene pool?

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 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.

BOARD QUESTION PAPER : MARCH 2016
BIOLOGY

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SECTION – I

[BOTANY]

Q.1. Select and write the most appropriate answer from the given alternatives for each sub-question: **[7]**

i. The phenotypic ratio of incomplete dominance is _____.
(A) 2 : 1 (B) 1 : 2 : 1
(C) 1 : 1 : 1 (D) 1 : 1 : 2

ii. The number of purines in a segment of DNA molecule is 68. What will be the number of pyrimidines in this segment?
(A) 34 (B) 43
(C) 68 (D) 86

iii. Alcoholic fermentation is brought about by _____.
(A) *Lactobacillus* (B) *Saccharomyces*
(C) *Trichoderma* (D) *Streptomyces*

iv. Which of the following is not a photosynthetic pigment?
(A) Carotene (B) Xanthophyll
(C) Phycobillins (D) Anthocyanin

v. Which one of the following is a stop codon?
(A) UAG (B) UAC
(C) AUG (D) UCA

vi. Pyruvate undergoes oxidative decarboxylation to produce _____.
(A) 2-PGA (B) α-Ketoglutarate
(C) Succinyl - Co- A (D) Acetyl - Co – A

vii. Which day is observed as 'World Environment Day'?
(A) 21st May (B) 5th June
(C) 25th September (D) 13th December

Q.2. (A) Answer in 'One' sentence only : **(6)[12]**

i. What is test cross?
ii. What is mycoherbicide?
iii. What is Anticodon?
iv. What is Humification?
v. How CO_2 makes idlies puffy?
vi. What is ecological succession?

(B) Sketch and label 'Ultrastructure of Chloroplast'. **(2)**

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

i. Write a short note on 'Mutational breeding'.
ii. Enlist the advantages of Biogas.
iii. Explain 'Carbon cycle'.
iv. Give the floral adaptations for chiropterophily.

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

i. Why the ratio in pleiotropy is 2 : 1? Explain it with example.
ii. Give the schematic representation of TCA cycle.
iii. Differentiate between cyclic and non-cyclic photophosphorylation.

(B) Give diagrammatic representation to show a perfect pairing and any 'two' Wobble pairings. **(3)**

Q.4. What is double fertilization? Describe the process in brief. **[7]**

OR

Define r-DNA technology. Give the basic steps in r-DNA technology and give any 'three' examples of the therapeutic products produced by r-DNA technology.

SECTION – II

[ZOOLOGY]

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

i. If centromere is situated in the middle of the chromosome, it is called _____.
(A) metacentric (B) acrocentric
(C) submetacentric (D) telocentric

ii. Which one of the following is useful in treatment of burns and wound healing?
(A) Tissue plasminogen activator.
(B) Tissue Growth Factor.
(C) DNAse
(D) Bovine growth hormone.

iii. Erythroblastosis foetalis is caused when mother is
(A) Rh^{+ve} (B) with antibody 'a'
(C) Rh^{-ve} (D) with antibody 'b'

iv. Deposition of fatty substances in the lining of arteries results in _____.
(A) arteriosclerosis (B) atherosclerosis
(C) hyperglycemia (D) hypotension

v. Struggle between cow and cow for getting grass is called _____.
(A) inter-specific struggle (B) environmental struggle
(C) struggle against natural calamities (D) intra-specific struggle

vi. In which type of adaptation, forelimbs are modified into wings?
(A) Aquatic adaptation (B) Volant adaptation
(C) Arboreal adaptation (D) Cursorial adaptation

vii. Mating of two closely related individuals within the same breed is called _____.
(A) in-breeding (B) out-breeding
(C) out-crossing (D) cross-breeding

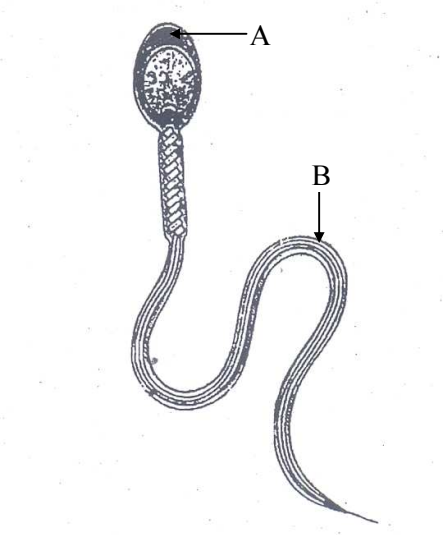
Q.6. (A) Answer in 'One' sentence each: **(6)[12]**

i. Visit of a veterinary doctor to dairy farm is mandatory. Give reasons.
ii. Why aquatic animals can afford to be ammonotelic?
iii. Why PUC is mandatory for all vehicles?
iv. Define organic evolution.
v. Give the genotype of Turner's syndrome.
vi. Write down the full form of R.F.L.P.

(B) Sketch and label T.S. of vein. **(2)**

(C) Attempt any TWO of the following: **(4)**

i. Give any 'two' factors responsible for genetic variation.
ii. Give the name and functions of 'A' and 'B' from the diagram given below:



iii. Write a note on 'artificial acquired active immunity'.
iv. Give the economic importance of 'fisheries'.

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

i. Explain sex determination in human beings.
ii. Describe steady population with the help of a pyramid.
iii. Illustrate any 'three' genes which can be used in gene therapy.

(B) Sketch and label 'L.S. of human kidney'. **(3)**

Q.8. With the help of diagrammatic representation, explain the process of gametogenesis. **[7]**

OR

Describe the structure of cerebrum. Add a note on its functions.

BOARD QUESTION PAPER : MARCH 2017
BIOLOGY

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SECTION – I

[BOTANY]

Q.1. Select and write the most appropriate answer from the given alternatives for each sub-question: **[7]**

i. The genotype of human blood group B is _____.
(A) I^Ai (B) I^Bi
(C) I^AI^A (D) *ii*

ii. Breakdown of detritus into smaller particles is called _____.
(A) fragmentation (B) leaching
(C) catabolism (D) humification

iii. In *Brassica* (rapeseed, mustard) _____ variety is resistant to Aphids.
(A) *Pusa A-4* (B) *Pusa Gaurav*
(C) *Pusa Sawni* (D) *Pusa Shubra*

iv. The antibiotic chloromycetin is obtained from _____.
(A) *Sclerotiana libertine* (B) *Aspergillus niger*
(C) *Streptomyces griseus* (D) *Streptomyces venezuelae*

v. The _____ enzyme is used to cut DNA at specific point.
(A) DNA polymerase (B) Alkaline phosphatase
(C) restriction endonuclease (D) DNA ligase

vi. R. Q. for proteins is about _____.
(A) 0.7 (B) 0.8
(C) 0.9 (D) 1.0

vii. Ozone depletion is occurring widely in the stratosphere, it leads to ozone hole caused mainly due to _____.
(A) ethylene (B) methane
(C) CFCs (D) CO_2

Q.2. (A) Answer each question in 'One' sentence only : **(6)[12]**

i. Give an example of the source of thermostable enzyme DNA polymerase.
ii. Give an example of the non-edible or poisonous mushroom, studied by you.
iii. Name the secondary metabolites in *Catharanthus roseus*.
iv. What is meant by ecological succession?
v. Name the organism and enzyme which bring about alcoholic fermentation of sucrose.
vi. Enlist any 'two' floral adaptations in *salvia*.

(B) Give schematic representation of carbon cycle. **(2)**

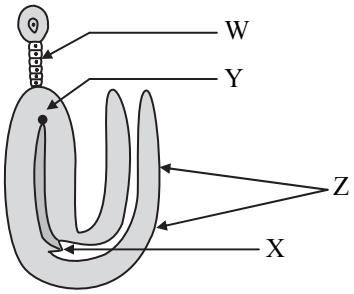
(C) Answer the following (Any TWO): **(4)**

i. What is a 'test cross'? Explain significance of a test cross.

ii. Explain 'Wobble hypothesis' with the help of a suitable diagram.

iii. What is a 'biopatent'? Explain it with a suitable example.

iv. Name the parts W, X, Y and Z from the following figure:



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

i. Explain replication of bacteriophage with the help of a suitable diagram.

ii. What are 'biofertilizers'? Explain them with suitable examples.

iii. Differentiate between anemophily and entomophily.

(B) Sketch and label V.S. of mature anatropous ovule. **(3)**

Q.4. What is 'photophosphorylation'? Describe non-cyclic photo-phosphorylation with schematic representation. Give its significance. **[7]**

OR

What is 'RNA'? Explain different types of non-genetic RNA with diagrams and functions.

BOARD QUESTION PAPER : MARCH 2017

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SECTION – II

[ZOOLOGY]

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

i. Which of the following has normal vision?
(A) $X^c X^c$ (B) $X^c Y$
(C) $X^C X^c$ (D) $X^c Y^c$

ii. In DNA fingerprinting technique, radioactive DNA probe is obtained from _____ of female banded krait snake.
(A) X chromosome (B) Y chromosome
(C) X and Y chromosomes (D) autosome

iii. Abortion in the first trimester of pregnancy may occur due to lack of _____.
(A) aldosterone (B) testosterone
(C) oestrogen (D) progesterone

iv. _____ contribute about 60% of the total volume of the semen.
(A) Prostate glands (B) Cowper's glands
(C) Seminal vesicles (D) Bartholin's glands

v. Lowering of blood pressure is related with the production of _____.
(A) ADH (B) ANF
(C) GH (D) LH

vi. Humulin is used to treat _____.
(A) Diabetes mellitus (B) Diabetes insipidus
(C) Hepatitis (D) Nephritis

vii. The modification of original genetic make-up is focussed by _____.
(A) PCR (B) DNA fingerprinting
(C) Electrophoresis (D) Gene therapy

Q.6. (A) Answer the following questions only in 'one' sentence each: **(6)[12]**

i. Which material is used for isolation of DNA in fingerprinting technique?
ii. Give significance of podocyte.
iii. What is 'commensalism'?
iv. What is the function of acrosome?
v. Distinguish between X and Y chromosomes. (Mention any 'two' points.)
vi. Give any 'two' examples of endangered species.

(B) Sketch and label the 'Structure of HIV'. **(2)**

(C) Attempt any TWO of the following: **(4)**

i. Write a note on erythrocytes.
ii. What are the uses of vaccine?
iii. Describe the process of budding in *Hydra*.
iv. Name the species used in sericulture. Name the stages in the life cycle of a silk moth in cyclic form.

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

i. Explain ABO blood group system in human being with a suitable chart.
ii. Describe diagrammatic representation of age structure showing declining population.
iii. With the help of a neat and labelled diagram, describe reflex arc.

(B) Sketch and label 'human male reproductive system'. **(3)**

Q.8. Enlist human endocrine glands.
Describe the T.S. of thyroid gland and add a note on deficiency of thyroxine. **[7]**

OR

Define 'evolution'. Give the principles of Darwin's theory of natural selection. Mention any 'one' objection to it.