

Pudukkottai - Dist

FIRST REVISION TEST - 2023

Exam No.

Time : 3-00 Hours

XII - BIOLOGY

Marks : 70

Note: Candidate should answer Part-I (Bio-Botany) & Part-II (Bio-zoology) in separate answer-books.

(PART - I) **BIO - BOTANY** (Marks:35)

SECTION - I

Note: 1) Answer all the questions. 2) Choose the correct answer. (8x1=8)

1. Match

- a. Orthotropus i) Cactaceae
 b. Hemianotropus ii) Alismataceae
 c. Amphitropus iii) Polygonaceae
 d. Circinotropus iv) Primulaceae

	a	b	c	d
a.	iii	iv	ii	i
b.	iii	iv	i	ii
c.	i	ii	iii	iv
d.	i	ii	iv	iii

2. Select the period for Mendel's hybridization experiments

- a) 1850-1857 b) 1853-1860 c) 1856-1863 d) 1859-1866

3. An allohexaploidy contains

- a) Six different genomes b) Six copies of three different genomes
 c) Two copies of three different genomes d) Six copies of one genome

4. EcoRI cleaves DNA at

- a) AGGGTT b) GTATATC c) GAATTC d) TATAGC

5. Which one is in descending order of a food chain

- a) Producers → Secondary consumers → Primary consumers → Tertiary consumers
 b) Tertiary consumers → Primary consumers → Secondary consumers → Producers
 c) Tertiary consumers → Secondary consumers → Primary consumers → Producers
 d) Tertiary consumers → Producers → Primary consumers → Secondary consumers

6. Find out the correct pair.

- a) N₂ fixing biofertilizer - Bacillus subtilis
 b) P solubilizing biofertilizer - Anabaena azollae
 c) P mobilizing biofertilizer - Pseudomonas striata
 d) Plant growth promoting Rhizobacteria - Pseudomonas fluorescense

7. Observe the following statements and pick out the right option from the following

Statement I - Perfumes are manufactured from essential oils**Statement II** - Essential oils are formed at different parts of the plants

- a) Statement I is correct b) Statement II is correct
 c) Both statements are correct d) Both statements are wrong

8. One green house gas contributes 14% of total global warming and another contributes 6%. These are respectively identified as

- a) N₂O and CO₂ b) CFCs and N₂O c) CH₄ and CO₂ d) CH₄ and CFCs

SECTION - II

Note: Answer any four of the following questions.

(4x2=8)

9. Define Genetics.

10. What is Mellitophily?

11. What is sterilization?

12. What is phytoremediation?

13. Define Deforestation.

14. Write short notes on Beauveria species?

SECTION - III

Note: Answer any three of the questions. Question No.19 is compulsory.

(3x3=9)

15. Write short notes on Sonora 64.

16. Draw the labelled structure of Ti Plasmid.

17. What is Albedo effect and write their effects?

18. What is Ozone hole?

19. Write short notes on Heterosis?

SECTION - IV

Note: Answer all the following questions.

(2x5=10)

20. a) What is endosperm? Explain the types.

(OR)

b) What do you know about the Artificial seed? Write its advantages.

21. a) Draw a pyramid from the following details and explain in brief.

Quantities of Organism are given-Hawks-50, plants-1000, rabbit and mouse - 250+250, pythons and lizard -100+50 respectively.

(OR)

b) Write the origin and area of cultivation of green gram and red gram.

12-Biology-1

(PART - I) BIO - ZOOLOGY (Marks:35)

SECTION - I

Note: 1) Answer all the questions. 2) Choose the correct answer. (8x1=8)

- Leydig cells secrete a hormone called _____.
 a) Inhibin **(b)** Testosterone c) Progesterone d) Oestrogen
- Which one of the following is 'Null' allele?
 a) $I^{A}I^{A}$ b) $I^{B}I^{B}$ c) $I^{A}I^{B}$ **(d)** $I^{O}I^{O}$
- An operon is a
 a) Protein that suppresses gene expression
 b) Protein that accelerates gene expression
(c) Cluster of structural genes with related function
 d) Gene that switched other genes on or off
- Who proposed the Germplasm theory?
 a) Darwin **(b)** August Weismann
 c) Lamark d) Alfred Wallace
- Match the following**
 1) Amoebiasis i) Tsetse fly ² **(a)** 1) iii, 2) i, 3) iv, 4) ii
 2) African sleeping sickness ii) Plasmodium ⁴ b) 1) iii, 2) j, 3) ii, 4) iv
 3) Kala-azar iii) House flies ¹ c) 1) iii, 2) ii, 3) i, 4) iv
 4) Malarial fever iv) Sand fly ³ d) 1) ii, 2) i, 3) iii, 4) iv
- Assertion(A):** Insulin Prevents diabetes Mellitus
Reason (R): Insulin helps to take glucose by the cells
 a) (A) is correct : but (R) is wrong b) (A) is wrong : but (R) is correct
 c) Both (A) and (R) are true, but (R) doesnot explain (A)
(d) Both (A) and (R) are true, (R) Explains (A)
- The relationship between sucker fish and shark is _____.
 a) competition **(b)** commensalism c) predation d) parasitism
- In the E-waste generated by the mobile phone which among the following metal is most abundant?
(a) copper b) silver c) chlorine d) florine

SECTION - II

Note: Answer any four of the following questions. (4x2=8)

- Expand the following. a) ZIFT b) ICST
- Write two functions of codon - AUG.
- Which is referred to as 'Industrial alcohol'? Why ?
- What is Eutrophication?
- What is meant by Totipotency?
- Write any two applications of finger printing.

SECTION - III

Note: Answer any three of the questions. Question No.19 is compulsory. (3x3=9)

- Write a note on conjugation.
- Differentiate between divergent evolution and convergent evolution with one example for each.
- Write a short note on 'stem cell banks'.
- Differentiate between J-shaped and S-shaped growth curves.
- A character present in grandfather goes to grandson through daughter. Draw flow chart for this pattern of Inheritance.

SECTION - IV

Note: Answer all the following questions. (2x5=10)

- a) Explain the permanent birth control methods. **(OR)**
 b) Explain any two genetical disorder diseases.
- a) Explain the structure of Thymus gland with neat diagram. **(OR)**
 b) Explain the major causes for biodiversity decline.

HIGHER SECONDARY SECOND YEAR
FIRST REVISION TEST 2023 – TENTATIVE SCORING KEY
PUDUKKOTTAI, DISTRICT.

(DISCLAIMER – This key is meant for students reference only and not for evaluation purpose)

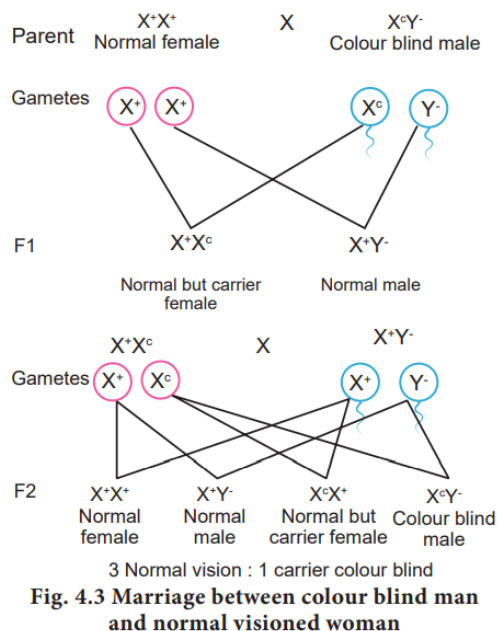
SUBJECT: BIO - ZOOLOGY

CLASS: 12

Q.NO	SECTION - I		8 x 1 = 8
1	b	Testosterone	1
2	d	I ^o I ^o	1
3	c	Cluster of genes with related function	1
4	b	August weismann	1
5	a	1 - iii, 2 – I, 3 – iv, 4 - ii	1
6	d	Both “A” and “R” are true, “R” explains “A”	1
7	b	Comensalism	1
8	a	Copper	1

SECTION – II			4 x 2 = 8
Answer any four of the following questions.			
9	Expand:	1. ZIFT - Zygote intra-fallopian transfer 2. ICSI - Intra-cytoplasmic sperm injection	-- 1 M -- 1 M
10	Functions of “AUG”	1. Act as initiator codon 2. Code for amino acid methionine	-- 1 M -- 1 M
11	Industrial alcohol:	1. Ethanol (C ₂ H ₅ OH) is referred as an industrial alcohol. 2. It is used for industrial, laboratory and fuel purposes.	-- 1 M -- 1 M
12	Eutrophication:	1. When run-off from land containing nutrients reaches water bodies like lakes, it results in dense growth of plant life.	-- 2 M
13	Totipotency:	1. (Toti-total) the ability of a single cell to divide and produce all of the differentiated cells in an organism.	-- 2 M
14	Application of DNA finger printing:	1. Forensic analysis Forensic analysis: It can be used in the identification of a person involved in criminal activities, for settling paternity or maternity disputes, and in determining relationships for immigration purposes. 2. Pedigree analysis: inheritance pattern of genes through generations and for detecting inherited diseases. 3. Conservation of wild life: protection of endangered species. By maintaining DNA records for identification of tissues of the dead endangered organisms. 4. Anthropological studies: It is useful in determining the origin and migration of human populations and genetic diversities.	Any two 2 M

SECTION - III											
Answer any six questions. Question no: 19 is compulsory.		3 x 3 = 9									
15	<p>Conjugation:</p> <ol style="list-style-type: none"> 1. It is the temporary union of the two individuals of the same species. 2. During their union both individuals, exchange certain amount of nuclear material (DNA) and then get separated. 3. Conjugation is common in ciliates. 4. E.g. Paramecium, Vorticella and bacteria (Prokaryotes). 	<p>-- 1 M</p> <p>-- 1 M</p> <p>-- ½ M</p> <p>-- ½ M</p>									
16	<p>Divergent evolution and Convergent evolution.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">S.NO</th> <th style="width: 45%;">Divergent evolution – 1 ½ M</th> <th style="width: 45%;">Convergent evolution – 1 ½ M</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Structures which are similar but perform different functions are called homologous structures that bring about divergent evolution.</td> <td>Organisms having different structural patterns but similar function are termed as analogous structures.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Fore limbs of vertebrates exhibit anatomical similarity with each other and are made of similar bones such as humerus, radius, ulna, carpals, metacarpals and phalanges.</td> <td>The wings of birds and insects are different structurally but perform the same function of flight that brings about convergent evolution.</td> </tr> </tbody> </table>	S.NO	Divergent evolution – 1 ½ M	Convergent evolution – 1 ½ M	1	Structures which are similar but perform different functions are called homologous structures that bring about divergent evolution.	Organisms having different structural patterns but similar function are termed as analogous structures.	2	Fore limbs of vertebrates exhibit anatomical similarity with each other and are made of similar bones such as humerus, radius, ulna, carpals, metacarpals and phalanges.	The wings of birds and insects are different structurally but perform the same function of flight that brings about convergent evolution.	3 M
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17	<p>Stem cell banks.</p> <ol style="list-style-type: none"> 1. Stem cell banking is the extraction, processing and storage of stem cells, so that they may be used for treatment in the future, when required. <p>Amniotic cell bank:</p> <ol style="list-style-type: none"> 2. it is a facility that stores stem cells derived from amniotic fluid for future use. Stem cells are stored in banks specifically for use by the individual from whom such cells have been collected and the banking costs are paid. <p>Cord Blood Banking:</p> <ol style="list-style-type: none"> 3. The extraction of stem cells from the umbilical cord during childbirth. 4. While the umbilical cord and cord blood are the most popular sources of stem cells, the placenta, amniotic sac and amniotic fluid are also rich sources in terms of both quantity and quality. 	<p>-- 1 M</p> <p>-- 1 M</p> <p>-- ½ M</p> <p>-- ½ M</p>									
18	<p>J and S shaped curve:</p> <p>J - Shaped curve:</p> <ol style="list-style-type: none"> 1. When a population increases rapidly in an exponential fashion and then stops abruptly due to environmental resistance or due to sudden appearance of a limiting factor. 2. They are said to exhibit J-shaped growth form. <p>S - Shaped curve:</p> <ol style="list-style-type: none"> 3. Some populations, as in a population of small mammals, increase slowly at first then more rapidly and gradually slow down as environmental resistance increases whereby equilibrium is reached and maintained. 4. Their growth is represented by S shaped growth curve. 	<p>-- 1 ½ M</p> <p>1 ½ M</p>									
19	<p>A trait is inherited from the male parent to his grandson through carrier daughter is called criss - cross pattern of inheritance.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1. Red-green colour blindness or daltonism, 2. haemophilia and Duchenne's 3. Muscular dystrophy. 	½ M									



1 M

1 ½ M

SECTION – IV

Answer all the Questions:

2 x 5 = 10

20 a

Permanent birth control methods.

Surgical sterilisation methods

1. They are the permanent contraception methods advised for male and female partners to prevent any more pregnancies. --- ½ M
2. It blocks the transport of the gametes and prevents conception. --- ½ M

Tubectomy:

1. This is the surgical sterilisation done in women.
2. A small portion of both fallopian tubes are cut and tied up through a small incision in the abdomen or through vagina.
3. This prevents fertilization as well as the entry of the egg into the uterus.

Vasectomy:

4. This is the surgical procedure for male sterilisation.
5. Both vas deferens are cut and tied through a small incision on the scrotum to prevent the entry of sperm into the urethra.
6. Vasectomy prevents sperm from heading off to penis as the discharge has no sperms in it.

20 b

1. A genetic disorder is a disease or syndrome that is caused by an abnormality in an individual DNA. --- ½ M
2. Abnormalities can range from a small mutation in a single gene to the addition or subtraction of an entire chromosome or even a set of chromosomes. --- ½ M

Mendelian disorders

Describe Thalassaemia.

1. Thalassaemia is an autosomal recessive disorder.
2. It is caused by gene mutation resulting in excessive destruction of RBC's due to the formation of abnormal haemoglobin molecules resulting in anaemia.
3. Normally haemoglobin is composed of four polypeptide chains, two alpha and two beta globin chains.
4. Patients have defects in either the alpha or beta globin chains causing the production of abnormal haemoglobin.
5. Thalassaemia is classified into alpha and beta based on which chain of haemoglobin molecule is affected.
6. It is controlled by two closely linked genes HBA1 and HBA2 on chromosome 16.
7. Mutation or deletion of one or more of the four alpha gene alleles causes Alpha Thalassaemia.
8. In Beta Thalassaemia (**Cooley's anaemia**) production of beta globin chain is affected.
9. It is controlled by a single gene (HBB) on chromosome 11.

Phenylketonuria.

--- 2 M

1. It is an inborn error of Phenylalanine metabolism caused due to a pair of autosomal recessive genes.
2. It is caused due to mutation in the gene PAH (Phenyl alanine hydroxylase) gene located on chromosome 12.
3. This enzyme is essential for the conversion of phenylalanine to tyrosine.
4. The affected individuals lack this enzyme, so phenylalanine accumulates and gets converted to phenylpyruvic acid.
5. It is characterized by severe mental retardation, light pigmentation of skin and hair. Phenylpyruvic acid is excreted in the urine.

Albinism.

--- 2 M

1. It is an inborn error of metabolism, caused due to an autosomal recessive gene.
2. Melanin pigment is responsible for skin colour. Absence of melanin results in a condition called albinism.
3. A person with the recessive allele lacks the tyrosinase enzyme system, which is required for the conversion of dihydroxyphenyl alanine (DOPA) into melanin pigment inside the melanocytes.
4. In an albino melanocytes are present in normal members in their skin, hair, iris, etc, but lack of melanin pigments.

Chromosomal Abnormalities

Autosomal aneuploidy in human beings

	Trisomy - 13	Trisomy – 21 - (Mar – 20)
1	✓ Patau’s Syndrome	✓ Down’s syndrome
2	✓ Meiotic non disjunction causes this chromosomal abnormality.	✓ Caused by abnormal cell division during the development of the sperm cell or the egg cell.
3	✓ Characterized by multiple and severe body malformations and profound mental deficiency.	✓ Ears are malformed, mouth is constantly open and the tongue protrudes
Symptoms		Symptoms
4	✓ Small head with small eyes	✓ Increased separation between the eyes
5	✓ Cleft palate	✓ Flattened nose.
6	✓ Malformation of the brain and internal organs.	✓ Defective development of the central nervous system,

Allosomal abnormalities in human beings:

	XXY Males	XO Females
1	Klinefelter’s syndrome	Turner’s Syndrome
2	✓ This genetic disorder is due to the presence of an additional copy of the X chromosome.	✓ This genetic disorder is due to the loss of X chromosome
3	✓ Persons with this syndrome have 47 chromosomes (44AA+XXY).	✓ Persons with this syndrome have 45 chromosomes (44 autosomes and one X chromosome) (44AA+XO).
Symptoms		Symptoms
4	✓ Sterile males, tall, obese, with long limbs, high pitched voice	✓ Sterile females, Low stature, webbed neck
5	✓ Under developed genitalia	✓ Under developed breast, rudimentary gonads
6	✓ feeble breast (gynaecomastia)	✓ lack of menstrual cycle during puberty

<p>21 a</p>	<p>Thymus gland: 8 x ½ = 4</p> <ol style="list-style-type: none"> 1. The thymus is a flat and bilobed organ located behind the sternum, above the heart. 2. Each lobe of the thymus contains numerous lobules, separated from each other by septa. 3. Each lobule is differentiated into compartments, 4. the outer compartment or outer cortex, is densely packed with immature T cells called thymocytes. 5. Whereas the inner compartment or medulla is sparsely populated with thymocytes. 6. One of its main secretions is the hormone thymosin. 7. It stimulates the T cell to become mature and immunocompetent. 8. Thus thymus is most active during the neonatal and pre - adolescent periods. <div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="274 571 593 851"> </div> <div data-bbox="1129 607 1228 640"> <p>1 Mark</p> </div> </div>
<p>21 b</p>	<p>Causes for biodiversity losses: Any five: 5 x 1 = 5</p> <ol style="list-style-type: none"> 1. Habitat loss, fragmentation and destruction (affects about 73% of all species) 2. Pollution and pollutants (smog, pesticides, herbicides, oil slicks, GHGs) 3. Climate change, 4. Introduction of alien/exotic species. 5. Over exploitation of resources (poaching, indiscriminate cutting of trees, over fishing, hunting, mining). 6. Intensive agriculture and aquaculture practices. 7. Hybridization between native and non-native species and loss of native species. 8. Natural disasters (Tsunami, Forest fire, Earth quake and Volcanic) 9. Industrialization, Urbanization, infrastructure development, Transport – Road and Shipping activity, communication towers, dam construction, unregulated tourism. 10. Co-extinction. <div style="text-align: right; margin-top: 20px;"> <p>Prepared by: BHARATHIRAJA A. M.Sc., M.Phil., M.Ed., DOA. PGT IN ZOOLOGY, PUDUKKOTTAI. CELL: 9944277623</p> </div>