PUDUKKOTTAI

HALF YEARLY EXAMINATION - 2023 | Exam No. | | | | | | |

Time : 3-00 Hours **XII - BIOLOGY** *Marks : 70*

Note : Candiate 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. Firet cell of male gametophyte in angiosperm is
   a) Micropore b) Megaspore
   c) Nucleus d) Primary Endosperm Nucleus
2. The dominant epistatio ratio is
   a) 9:3:3:1 b) 12:3:1
   c) 9:3:4 d) 9:6:1
3. PBR 322, BR stands for
   a) plasmid bacterial recombination b) plasmid bacterial reptication
   c) plasmid boliver and rodriguez d) plasmid boltimore and rodriguez
4. Virus free plants are developed from
   a) Organ culture b) Meristem culture
   c) Protoplast culture d) Cell suspension culture
5. A specific place is an erosystem, where an organism lives and performs its function is
   a) habitat b) niche
   c) landscape d) biome
6. The unit of measuring ozone thickness
   a) Joule b) Kilos
   c) Dobson d) Watt
7. Jaya and Ratna are the semi dwarf variation of
   a) wheat b) rice
   c) cowpea d) mustard
8. Tectona grandis is coming under family
   a) Lamiaceae b) Fabaceae
   c) Dipterocarpaceae d) Ebenaceae

SECTION - II

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

9. What is Endothelium?
10. What is Backcross?
11. Name the chemicals used in genetransfer.
12. Define: Embriyoids
13. What is Myrmecophily?
14. Define - Heterosis.

SECTION - III

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

15. Write short note on pollenkit.
16. PBR 322 - Explain it.
17. Name the different types of hydrophytes.
18. What is Ozone Hole?
19. What is organic farming?

SECTION - IV

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

20. a) Explain the structure of ovule with diagram. ***(OR)***
    b) Compare the various type of Blottin techinque.
21. a) What are the advantages of seed dispersal? ***(OR)***
    b) Write the application of plant tissue culture.

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

SECTION - I

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

1. **Assertion:** In the honey bee society, all the members are diploid except drones.
   Reason: Drones are produced by parthenogenesis
   a) Both 'A' and 'R' are true and 'R' is correct explanation for 'A'
   b) Both 'A' and 'R' are true but 'R' is not the correct explanation for 'A'
   c) 'A' is true but 'R' is false
   d) Both 'A' and 'R' are false
2. What can be the blood group of offspring when both parents have AB blood group?
   a) AB only b) A, B and AB c) A, B, AB and O d) A and B
3. The common substrate used in distilleries for the production of ethanol is _____
   a) Soyameal b) Groundgram
   c) Molasses d) Corn meal
4. Animals that can move from freshwater to sea are called as
   a) Stenothermal b) Anadromous
   c) Eurythermal d) Catadromous
5. Individual responsible to face extinction of the fish called Labeo Kontius is
   a) Cichlid b) Nile Perch c) Talapia d) Puntisdubus
6. Allergy involves
   a) IgE b) IgG c) IgD d) IgM
7. Select the correct options
   A) Hormonal barriers prevents the ovaries from relasing the ova and thickens the cervical fluid
   B) Intrautherine Devices increase phagocytos is of sperm within the uterus
   C) Hormone-relasing IUD decrease the viscosity of the cervical mucus of these
   a) only A is correct b) A and B are correct
   c) A and C are correct d) B and C are correct
8. The book philosophic Zoologique was written by
   a) Darwin b) August weismann c) Weinberg d) Lamarck

SECTION - II

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

9. How is polyspermy avoided in humans?
10. What is Biomagnification?
11. What are called connecting links? Give an example.
12. Differentiate Leading strand from Lagging strand.
13. What are stenotherms? Give example.
14. What are DNA Vaccines?

SECTION - III

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

15. Distinguish between Totipotency and pluripotency.
16. State the goals of the human genome project.
17. Write the uses of Karyotyping.
18. Draw a labelled sketch of human mature sperm.
19. Compare the terms. Probiotics and Prebiotics.

SECTION - IV

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

20. a) Explain the different kinds of syngamy in organisms. ***(OR)***
    b) Describe the methods to detect foetal disorders during early pregnancy.
21. a) Explain the structure of an antibody with diagram. ***(OR)***
    b) The most serious aspect of the loss of biodiversity is the extinction of species. Justify this and explain the types of extinction.

HIGHER SECONDARY SECOND YEAR – PUDUKKOTTAI DIST.
HALF YEARLY EXAMINATION – 2023.
Scoring key

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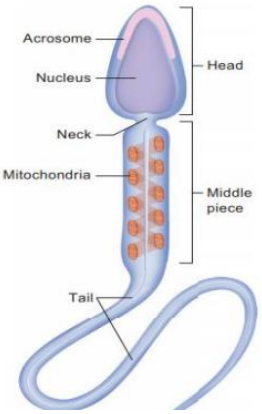
SUBJECT: BIO - ZOOLOGY **CLASS: 12**

Q.NO	SECTION - I	
1	a) Both A' and 'R' are true and 'R' is correct explanation for 'A	
2	b) A, B and AB	
3	c) Molasses	
4	d) Catadromous	
5	c) *Tilapia*	
6	a) Ig E	
7	b) A and B are correct	
8	d) Lamarck	
	SECTION – II **Answer any four questions:**	**4 x 2 = 8**
9	**How is polyspermy avoided in humans?** 1. Once fertilisation is accomplished, 2. The cortical granules of the cytoplasm of the ovum form a barrier called the fertilisation membrane. 3. It prevents further penetration of other sperms. 4. Thus, polyspermy is prevented.	½ ½ ½ ½ **2 MARK**
10	**What is Biomagnification?** 1. When non-degradable substances enter the food chain, 2. They do not get metabolized or broken down. 3. They get transferred up the tropic levels of the food chain. 4. During this process, they show an increase in concentration which is referred to as biomagnification.	½ ½ ½ ½ **2 MARK**
11	**What are called connecting links? Give an example.** **1.** The organisms which possess the characters of two different groups are called connecting links. **2. Example: Peripatus** - Connecting link between Annelida and Arthropoda. **3. Archeopteryx** - connecting link between Reptiles and Aves.	**1** **Any 1 Ex** **1** **2 MARK**
12	**Differentiate Leading strand from Lagging strand.**	

Leading strand	Lagging strand
Template strand	Coding strand
DNA strand with 3' —— 5' polarity.	DNA strand with 5' ——3' polarity
Replication is continuous	Replication is discontinuous

1
½
½
2 Mark

13	**What are stenotherms? Give example.** 1. Organisms which can tolerate only a narrow range of temperature are Stenotherms. 2. **Example:** Fish, Frogs, Lizards and Snakes.	**1** **1** **2 MARK**
14	**What are DNA Vaccines?** 1. The immune response of the body is stimulated by a DNA molecule. 2. A DNA vaccine consists of a gene encoding an antigenic protein, 3. gene inserted onto a plasmid, and then incorporated into the cells in a target animal.	**1** **½** **½** **2 MARK**
	SECTION – III **Answer any three questions. Question No – 19 is compulsory**	**3 X 3 = 9**
15	**Distinguish between Totipotency and pluripotency.** 1. **Totipotency (Toti-total):** The ability of a single cell to divide and produce all of the differentiated cells in an organism. 2. **Pluripotency (Pluri-several):** A stem cell that can differentiate into any of the three germ layers-ectoderm, endoderm and mesoderm.	**1 ½** **1 ½** **3 MARK**
16	**State the goals of the human genome project.** **1.** Identify all the genes in human DNA. **2.** Determine the sequence of the three billion chemical base pairs that makeup the human DNA. **3.** To store this information in databases and Improve tools for data analysis. **4.** Transfer the related technologies to other sectors such as industries. **5.** Address the Ethical, Legal and Social issues (ELSI).	**Any 3** **3 X 1 = 3** **3 MARK**
17	**Write the uses of Karyotyping** 1. It helps in gender (male and female) identification. 2. It is used to detect the chromosomal aberrations like deletion, duplication, translocation, nondisjunction of chromosomes. 3. It helps to identify the abnormalities of chromosomes like aneuploidy. 4. Used in predicting the evolutionary relationships between species. 5. Genetic diseases in human beings can be detected.	**Any 3** **3 x 1 = 3** **3 MARK**
18	**Draw labelled sketch of human mature sperm.**  	**Diagram** **Parts** **2 + 1 = 3** **3 MARK**

19

Compare the terms. Probiotics and Prebiotics

1. **Prebiotics:** Compounds in food (fibers) that induce the growth or activity of beneficial microorganisms. **1 ½**
2. **Probiotics:** living microorganisms to provide health benefits and improving or restoring the gut flora. **1 ½**

3 MARK

SECTION – IV

Answer all the questions: **2 x 5 = 10**

20. A

a) Explain the different kinds of syngamy in organisms.

S.No	Autogamy	Exogamy
1	Male and female gametes are produced by the same cell or same organism.	The male and female gametes are produced by different parents.
2	Both the gametes fuse together to form a zygote.	They fuse to form a zygote. it is biparental.
3	**Ex.** Actinosphaerium and Paramecium.	**Ex**. Human - dioecious or unisexual animal.

S.No	Hologamy	Paedogamy
1	In lower organisms, organisms themselves behave as gametes	Union of young individuals produced immediately after the division of the adult parent cell by mitosis.
2	The fusion of such mature individuals is known as hologamy	
3	**Ex. Trichonympha.**	

S.No	Merogamy	Isogamy
1	The fusion of small sized and morphologically different gametes	the fusion of morphologically and physiologically identical gametes
2	Merogametes.	Isogametes – **Ex:** Monocystis.

- Anisogamy – It is the fusion of dissimilar gametes. **Ex. higher invertebrate and all vertebrate.**

Any five types with example - 5 x 1 = 5

OR

20. B

How can we detect the foetal disorders during the early stages of pregnancy?

a) Ultrasound scanning: **- - - - 1 ½ Mark**

1. Ultrasonography is usually performed in the first trimester for dating.
2. Used to determination of the number of foetuses, and for assessment of early pregnancy complications.
3. **Advantages:** No known risks other than mild discomfort due to pressure from the transducer on the abdomen or vagina.
4. No radiation is used during this procedure.

b) Amniocentesis: **- - - - 1 ½ Mark**

1. Amniocentesis involves taking a small sample of the amniotic fluid.
2. Used to diagnose for chromosomal abnormalities.
3. Amniocentesis is generally performed in a pregnant woman between the 15^{th} and 20^{th} weeks of pregnancy.
4. From the amniotic sac to withdraw a small sample of amniotic fluid.
5. Cells of amniotic fluid studied for chromosomal abnormalities.

c) CVS: **- - - - 1 Mark**

- It is a prenatal test that involves taking a sample of the placental tissue to test for chromosomal abnormalities.

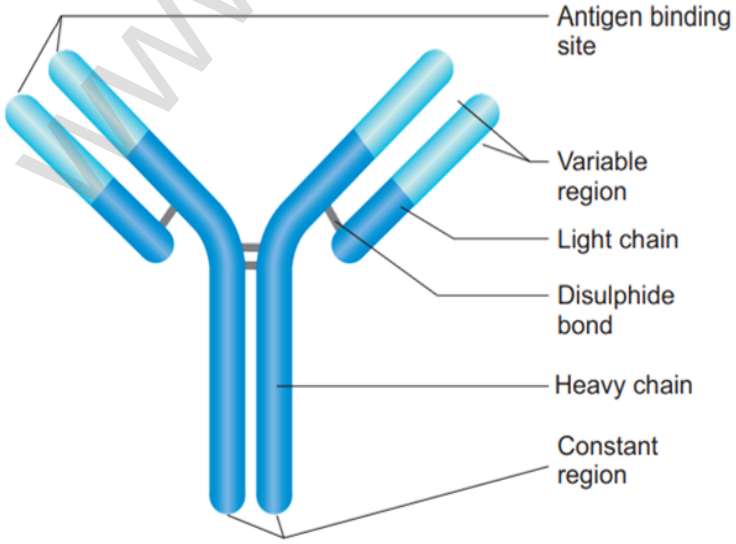
d) Foetoscope: **- - - - 1 Mark**

- It is used to monitor the foetal heart rate and other functions during late pregnancy and labour.
- The average foetal heart rate is between 120 and 160 beats per minute.
- An abnormal foetal heart rate or pattern may mean that the foetus is not getting enough oxygen and it indicates other problems.

21. A

a) Explain the structure of an antibody with diagram.

1. In 1950s, Porter and Edelman revealed the basic structure of the immunoglobulin.
2. An antibody molecule is "Y" shaped structure that comprises of 4 four polypeptide chains.
3. Two identical light chains (L) of molecular weight 25,000 Da (214 amino acids).
4. Two identical heavy chains (H) of molecular weight 50,000 Da (450 amino acids).
5. The polypeptide chains are linked together by di-sulphide (S-S) bonds.
6. One light chain is attached to each heavy chain and 2 heavy chains are attached to each other to form a Y shaped structure. Hence, an antibody is represented by H2 L2.
7. **Two terminals:** C - terminal (Carboxyl) and amino or N-terminal.
8. **Two regions:** They have variable (V) region and (C) region at the other end.



Any 6 POINTS 6 X ½ = 3

Diagram – 2 Mark

21. B	**Types of extinction.** 1. **Extinct:** None of members of species are alive anywhere in the world. **- - - 1 Mark** **Natural extinction: - - - 1 ½ Mark** 1. It is a slow process of replacement of existing species with better adapted species due to changes in environmental conditions, evolutionary changes, predators and diseases. 2. A small population can get extinct sooner than the large population due to inbreeding depression (less adaptivity and variation). **Mass extinction: - - - 1 Mark** 1. The earth has experienced quite a few mass extinctions due to environmental catastrophes. 2. A mass extinction occurred about 225 million years ago during the Permian, where 90 % of shallow water marine invertebrates disappeared. **Anthropogenic extinctions: - - - ½ Mark** 1. These are abetted by human activities like hunting, habitat destruction, over exploitation, urbanization and industrialization. **Examples: Any two example ½ Mark** 1. **Dodo of Mauritius** and 2. **Steller's Sea cow** of Russia. **- - - ½ Mark** 3. Amphibians seem to be at higher risk of extinction because of habitat destruction. Prepared by: **BHARATHIRAJA A** M.Sc., M.Phil., M.Ed., DOA, PGT IN ZOOLOGY, PUDUKKOTTAI. CELL: 9944277623