

HSC +2 PUBLIC EXAMINATION MARCH -2023

BIO - ZOOLOGY

QUESTION WITH ANSWERS

QUESTION TYPE – B

SECTION - 1

I. CHOOSE THE CORRECT ANSWER:

(1 MARK)

1. b. Progesterone and estrogen
2. a. Amphibians
3. c. Fungi
4. d. IgA
5. a. 13 – trisomy
6. d. Exogenous budding
7. d. Lipases
8. d. Anti – viral substance

SECTION – 2

II. ANSWER ANY 4 QUESTIONS

(2 MARK)

9. What are the three layers of uterine wall?

Answer:

- ❖ Perimetrium – outer thin membranous serous layer
- ❖ Myometrium – middle thick muscular layer
- ❖ Endometrium – inner glandular layer

10. Which are called as non-sense codons in genetic code?

Answer:

UAA, UAG and UGA codons are designated as termination (stop) codons and also are known as “non-sense” codons.

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11. Differentiate Convergent evolution and Divergent evolution

Answer:

Convergent evolution	Divergent evolution
It is a Analogous structure	It is a homologous structure
Organisms having different structural pattern, but similar function.	Organisms having similar structural but perform different function.
Example: The wings of birds and insects.	Example: Fore limbs and hind limbs of vertebrates.

12. Name any four human viral diseases?

Answer:

Disease	Causative agent
Common cold	Rhino viruses
Mumps	Mumps virus
Measles	Rubella virus
Viral hepatitis	Hepatitis – B virus

13. Give the expansion of

- a) CFC - Chlorofluorocarbons
- b) PAN – Peroxyacetyl nitrate

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14. What are stenotherms?

Answer:

- ❖ Those organisms which can tolerate only a narrow range of temperature are stenotherms.
- ❖ Example: Fish, Frogs, Lizards and Snakes.

SECTION – 3

III. ANSWER THE ANY 3 QUESTIONS:

(3 MARK)

15. What is meant by regeneration? Give example

Answer:

Regeneration is the natural process of replacing or restoring damaged or missing cells, Tissues, organs, and even entire body parts of full function in plants and animals.

Example: Hydra, Starfish

16. Mention any three applications of karyotyping

Answer:

- ❖ It helps in gender identification
- ❖ It is used to detect the chromosomal aberration like deletion, duplication, translocation, non disjunction of chromosomes.
- ❖ It helps to identify the abnormalities of chromosomes like aneuploidy.

17. What is single cell protein? Write its uses.

Answer:

- ❖ Single cell protein refers to edible unicellular Micro organisms like spirulina.
- ❖ Protein extracts from pure or mixed culture of algae, yeasts, fungi (or) bacteria may be used as ingredient or as a substitute for rich foods and is suitable for human consumption or animal food.

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18. What are the difference between in- situ and ex- situ conservation?

Answer:

In- situ conservation	Ex- situ conservation
It is the on-situ conservation or the conservation of genetic resources in natural population of plants or animal species.	This is a conservation strategy which involves placing of threatened animals and plants in special care locations for their protection.
It is the process of protecting an endangered plant or animal species in its natural habitat, either by protecting (or) restoring the habitat itself, or by defending the species from predators.	It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.
National parks, biosphere reserve.	Zoological parks and botanical gardens.

19. What are the multipotent cells in replenishing adult tissue? What is the rich source for it?

Answer:

- ❖ Stem cells are unspecialized cells of the human body. They are able to differentiate into any cell of an organism and have the ability of self-renewal. Stem cells exist both in embryos and adult cells.
- ❖ Adult cells are found in various tissues of children as well as adults.
- ❖ An adult stem cell or somatic stem cell can divide and create another cell similar to it. Most of the adult stem cells are multipotent and can act as a repair system of the replenishing adult tissues.
- ❖ The red bone marrow is a rich source of adult stem cells.

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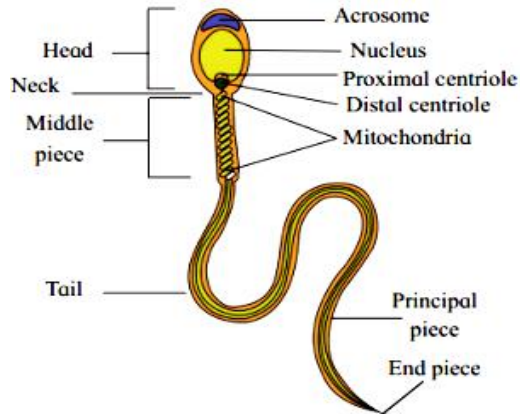
SECTION – 4

IV.ANSWER THE FOLLOWING:

(5MARKS)

20. a) Describe the structure of human sperm with neat labeled diagram.

Answer:



Structure of human sperm:

- ❖ The male gamete is called as spermatozoan or sperm.
- ❖ It is a single cell structure and it bears a haploid set of chromosomes in the nucleus.
- ❖ Human sperm has a head , neck, middlepiece and tail.
- ❖ It produces energy in the form of ATP molecules for the movement of sperms.

Head:

- ❖ The human body of the sperm is enveloped by plasma membrane.
- ❖ The head comprises of two parts namely acrosome and nucleus.
- ❖ Acrosome is small cup like pointed structure present at the tip of the nucleus and formed golgi body of the spermatid. It contain hyaluronidase which helps to penetrate the ovum during fertilization.
- ❖ The nucleus is flat and oval.

Neck:

- ❖ The neck is very short and is present between the head and the middle piece.

Middle piece:

- ❖ The Middle Piece possesses mitochondria Spirally twisted around axial filament called mitochondrial spiral (or) Nebenkern
- ❖ It Produces energy form of ATP for the movement of Sperm

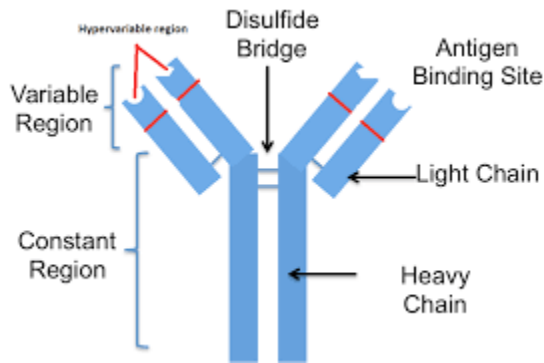
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Tail:

- ❖ The tail is the longest Part of the sperm and is slender and tapering
- ❖ It formed of a Central axial filament (or) axoneme and an outer proto plasmic sheath.
- ❖ The Lashing movement of the tail push the Sperm forward.
- ❖ Most of the sperms are mono-flagellated

b). Explain the Structure of immunoglobulin with Suitable Diagram

Answer:



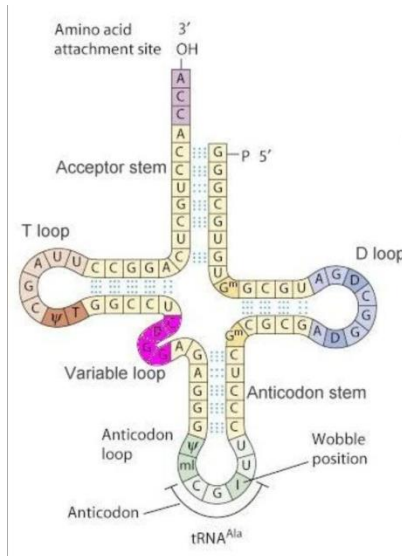
- ❖ In the 1950s, experiments by Porter and Edelman revealed the basic structure of the immunoglobulin
- ❖ An antibody molecule is y shaped structure that comprises of four polypeptide chains, two identical light chain(L) of Molecular weight 25,000 Da (approximately 214 amino acids) and 2 identical heavy chain (H) of Molecular weight 50,000 Da (approximately 450 amino acids).
- ❖ The polypeptide chains are linked together by di-sulphide (s-s) bonds
- ❖ one light chain is attached to each heavy Chain and two heavy chains are attached to each other to form a y shaped structure.
- ❖ Hence, an antibody is represented by H_2L_2 .
- ❖ The heavy chains have a flexible hinge region at their approximate middles
- ❖ Each chain [L and H] has two terminals.
- ❖ They C- terminal [carboxyl] and amino (or) N-terminal.
- ❖ Each chain [L and H] has two region.
- ❖ They have variable [V] region at one end and a much larger constant [c] region at the other end.
- ❖ Antibodies responding to different antigens have very different (V) regions but their (C) region are the same in all antibodies.
- ❖ In each arm of the monomer antibody the (v) regions of the heavy and light chains combines to form an antigen -binding site shaped to 'fit' a Specific antigenic determinant
- ❖ Consequently each antibody monomer has two such antigen-binding regions.
- ❖ The [C] regions that form the stem of the antibody monomer determine the antibody class and serve common function in all antibodies.

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- ❖ The function of immunoglobulin are agglutination , Precipitation, opsonisation Neutralization etc.

21) a) Explain the Structure of RNA which plays a vital role in Protein Synthesis by transferring amino acid With diagram

Answer :



- ❖ Transfer RNA (tRNA) is a type of RNA that plays a vital role in protein Synthesis by delivering amino acids to the ribosome.
- ❖ The Structure of tRNA is a distinctive L Shaped molecule that is about 70-80 nucleotides long. It has a stem – Loop structure that contains several important regions.
- ❖ The three critical regions of tRNA are

Acceptor stem :

- ❖ This is the site where the specific amino acids is attached to the t RNA.
- ❖ It is located at the 3¹ end of the tRNA and consists of a sequence of three nucleotides, CCA.

Anticoden loop:

- ❖ This is the site where the tRNA binds to the mRNA codon during Protein Synthesis. It is located at the Center of the tRNA and Contains a Sequence of three Nucleotides that are Complementary to the codon on the mRNA

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T ψ C arm:

- ❖ This is a region that contains a sequence of three nucleotides, T ψ C which are modified after transcription. The modification help to Stabilize the tRNA structure
- ❖ In addition to these three regions, tRNA also Contains several other stem-loops that help to Stabilize its structure.
- ❖ These stem-loops can have varying lengths and can be involved in interactions with other molecules during protein synthesis.
- ❖ overall the unique L shaped structure of tRNA allows it to interact with both the mRNA and the ribosome during Protein Synthesis and ensures that the correct amino acid is incorporated into the growing protein chain.

b. List out the human activities Causing biodiversity Loss?

Answer:

- ❖ Habitat Loss, Fragmentation and destruction [affect about 73% of all Species]
- ❖ Pollution and Pollutants [smog, pesticides, herbicides, oil slicks, GHGs]
- ❖ Climate Change
- ❖ Introduction of alien / exotic species
- ❖ over exploitation of resources (poaching, indiscriminate cutting of trees, over fishing, hunting, Mining)
- ❖ Intensive agriculture and aquacultural practices.
- ❖ Hybridization between Native and Non-Native Species and Loss of water Native Species
- ❖ Natural Disasters (Tsunami, forest fire, earth quake, Volcanoes).
- ❖ Co-extinction

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