DIRECTORATE OF GOVERNMENT EXAMINATION, CHENNAI-6
HSC SECOND YEAR PUBLIC EXAMINATION.MARCH/APRIL-2023
PART–II BIO-ZOOLOGY KEY ANSWER

NOTE :

1. **Answer written only in BLACK or BLUE should be evaluated**
2. **Choose the correct answer and write the option code**
3. **If one of them (option or answer) is wrong, then award zero mark only**

Maximum Marks: 35

Note: - Answer all the questions.

SECTION -1 **8×1 =8**

Q. No	ANSWER			
	TYPE - A		TYPE - B	
1	a	13 - Trisomy	b	Progesterone and estrogen
2	d	Exogenous budding	a	Amphibians
3	d	IgA	c	Fungi
4	d	Anti-viral substances	d	IgA
5	b	Progesterone and estrogen	a	13 - Trisomy
6	c	Fungi	d	Exogenous budding
7	a	Amphibians	d	Lipase
8	d	Lipase	d	Anti-viral substances

SECTION -2

Note:-Answer any four questions **4 × 2 =8**

Q.No	ANSWERS	MARKS
9	**Three layers of Uterine wall**:- (i) Outerlayer - Perimetrium, (ii) Middle layer -Myometrium (iii) Innerlayer - Endometrium.	**2**
10	**Non- sense codons: -** (i) UAA (ii) UAG (iii) UGA	**2**

<table>
<tr><td>11</td><td>Convergent and Divergent Evolution: -
<table>
<tr><th>S.no</th><th>Convergent Evolution:</th><th>Divergent Evolution:</th></tr>
<tr><td>1</td><td>Organs having different structural patterns but similar function.</td><td>Structure which are similar in origin but perform different functions</td></tr>
<tr><td>2</td><td>(E.g.) Wings of birds and insects</td><td>(E.g.) Fore limbs of vertebrates</td></tr>
</table></td><td>1

1</td><td>2</td></tr>
<tr><td>12</td><td>Human viral diseases: - (any Four)
(i) Common cold
(ii) Mumps
(iii) Measles
(iv) Viral hepatitis
(v) Chicken pox
(vi) Poliomyelitis
(vii) Dengue fever
(viii) Chikungunya
(Other relevant answers may also give mark)</td><td>4 x ½</td><td>2</td></tr>
<tr><td>13</td><td>Expansion of CFC and PAN: -
(i) Chlorofluorocarbon
(ii) Peroxy acetyl nitrate</td><td>1
1</td><td>2</td></tr>
<tr><td>14</td><td>Stenotherms: -
(i) Organisms which can tolerate only a narrow range of temperature
(ii) (E.g.) Fish, Frogs, Lizards and Snakes
(Any two example)</td><td>1
1</td><td>2</td></tr>
<tr><td colspan="4">SECTION - 3
Note:- Answer any three question. Question no.19 is compulsory
3×3 = 9</td></tr>
<tr><td>15</td><td>Regeneration: -
(i) Regrowth in the injured region .
(ii) (E.g.) Hydra and Planaria,Star fish, tail of wall lizard, only certain damaged tissue in human.
(Any two example)</td><td>2
1</td><td>3</td></tr>
<tr><td>16</td><td>Applications of Karyotyping: - (Any Three)
(i) It helps in gender identification.
(ii) It is used to detect the chromosomal aberrations
(iii) It helps to identify the abnormalities of chromosomes like aneuploidy.
(iv) It is also used in predicting the evolutionary relationships between species.
(v) Genetic diseases in human beings can be detected by this technique.</td><td>3×1</td><td>3</td></tr>
</table>

<table>
<tr><td>17</td><td>Sigle cell protein: -
Edible unicellular microorganisms likes spirulina.

Uses: (Any Two)
(i) Substitute for protein rich foods and
(ii) Suitable for human consumption
(iii) Used as animal feed</td><td>1

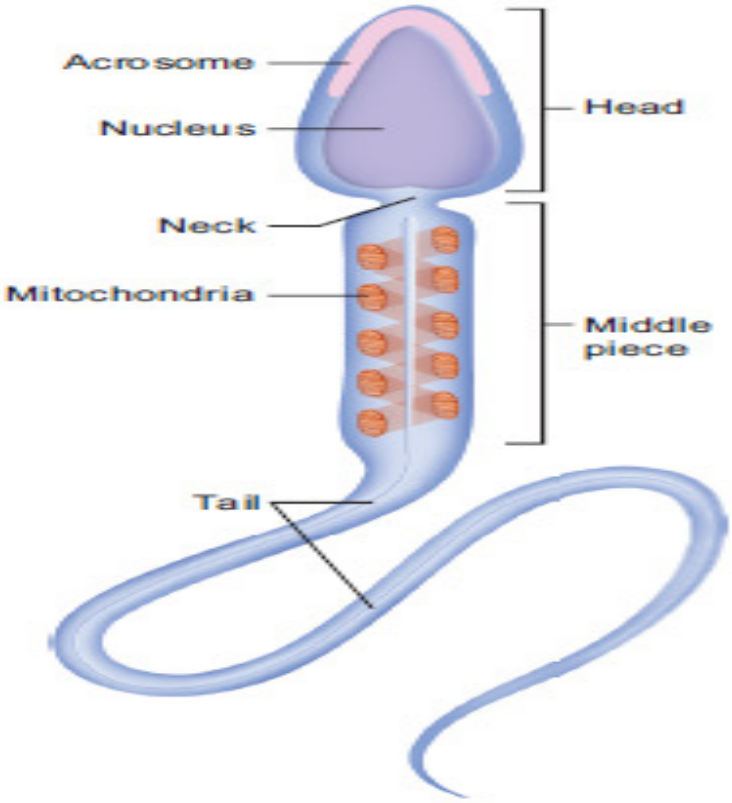
2×1</td><td>3</td></tr>
<tr><td>18.</td><td>Difference between in-situ and ex-situ conservation: -

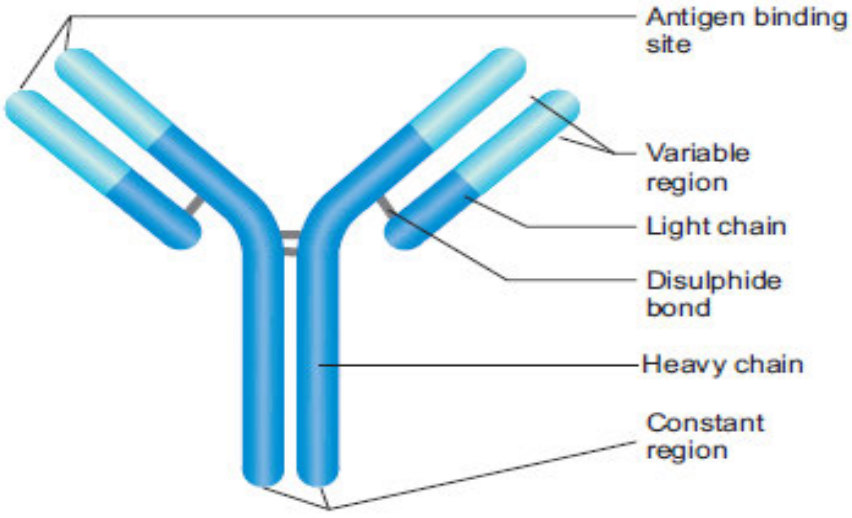
<table><tr><th>S.No</th><th>insitu conservation</th><th>exsitu conservation</th></tr><tr><td>1</td><td>It is the on-site conservation or the conservation of genetic resources in natural populations of plant or animal species</td><td>This is a conservation strategy which involves placing of threatened animals and plants in special care locations for their protection</td></tr><tr><td>2</td><td>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</td><td>It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.</td></tr><tr><td>3</td><td>National Parks, Biosphere Reserve and Wild Life Sanctuaries</td><td>Zoological parks and Botanical gardens</td></tr></table></td><td>3×1</td><td>3</td></tr>
<tr><td>19</td><td>Multipotent cells – replenishing adult tissues: -

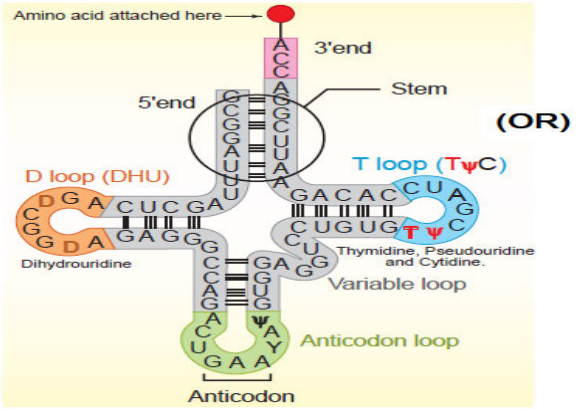
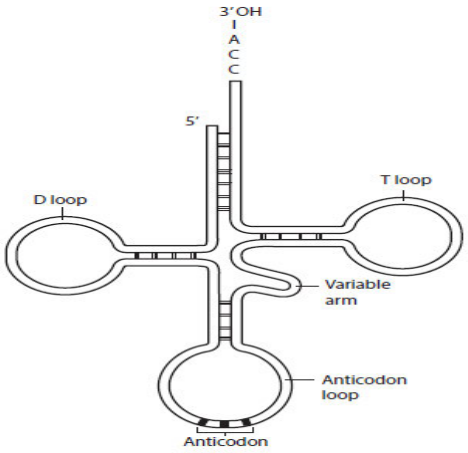
(i) Most of the Adult stem cells are multipotent.
(ii) And can act as a repair system of the body replenishing adult tissues .
(iii) Rich source - Red bone marrow</td><td>1
1
1</td><td>3</td></tr>
</table>

SECTION – 4

Note: -Answer all the questions. **5×2=10**

20 (a)	**Structure of Human sperm:** (i) The human sperm is a microscopic, flagellated and motile gamete (ii) Body composed of a head, neck and a tail. **Head:** (iii) The head comprises of two parts namely acrosome and nucleus. (iv) Acrosome is a small cap like pointed structure present at the tip of the nucleus (v) Acrosome contains hyaluronidase, a proteolytic enzyme(sperm lysin) **Neck:** (vi) Very short and is present between the head and the middle piece. (vii) It contains the proximal centriole towards the nucleus and distal centriole away from nucleus **Middle piece:** (viii) It possesses mitochondria spirally twisted around the axial filament called mitochondrial spiral or nebenkern. **Tail:** (ix) Longest part of the sperm and is slender and tapering. (x) It is formed of a central axial filament or axoneme and an outer protoplasmic sheath. **Draw and Label**  	**6 ×½ = 3** **2**	**5**

20 (b)	**(Or)** **Structure of Immunoglobulin:** (i) It is **Y** shaped structure that comprises of four polypeptides chains. (ii) It consists of Two identical light chains **(L)**and two identical heavy chains **(H)** (iii)Molecular weight of L-chain is 25,000 Da and molecular weight of H-chain is 50,000 Da. (iv) The polypeptide chains are linked together by di-sulphide (S-S) bonds (v) One light chain is attached to each heavy chain and two heavy chains are attached to each other to form a Y shaped structure. (vi) The heavy chains have a flexible hinge region at their approximate middles. (vii) Each chain (**L** and **H**) has two terminals. They are C - terminal (Carboxyl) and amino or N-terminal. (viii) Each chain (**L** and **H**) has two regions. They have variable (**V**) region at one end and constant (**C**) region at the other end. **Draw and Label**  	**6×½ =3** **2**	**5**

21 (a)	**Structure of RNA:** (i) tRNA molecule of the cell acts as a vehicle that pick up the amino acids scattered through the cytoplasm (ii) The secondary structure of tRNA depicted in looks like a clover leaf. (iii) In actual structure, the tRNA is a compact molecule which looks like an inverted L. (iv) The clover leaf model of tRNA shows the presence of three arms namely DHU arm, middle arm and TΨC arm. (v) These arms have loops such as amino acyl binding loop, anticodon loop and ribosomal binding loop at their ends. (vi) In addition it also shows a small lump called variable loop or extra arm. (vii) The amino acid is attached to one end (amino acid acceptor end) and the other end consists of three anticodon nucleotides. **Draw and Label**  (OR)  	**6×½= 3** **2**	**5**

21 (b)	**(Or)** **Human activities of causing biodiversity loss:-** Direct and indirect human activities have a detrimental effect on biodiversity. **(a). Direct human activities** (i) Change in local land use (ii) Species introduction or removal (iii) Harvesting (iv) Pollution and (v) Climate changes (**b). Indirect human activities:** (i) Demographic (ii) Economic (iii) Technological (iv) Cultural and religious factors. **(Other relevant answers may also give mark)**	**2 ½** **2 ½**	**5**