Mrs. M. AHAMED NOWROSE BEGAM M.Sc., M.Phil., B.Ed., M.A., M.Phil., (Edn.)

PRINCIPAL, J.M. MATRIC. GIRLS HR. SEC. SCHOOL, CHENNAI – 6000 007

Class :12

Register number						

FIRST REVISION EXAMINATION - 2022-23

PART- II BIO- ZOOLOGY

Time allotted: 1½ Hours **Max. Marks: 35**

SECTION- I

NOTE:

(i) Answer all the questions.

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer. 8 x 1 = 8

PART-I

1. The mode of reproduction in bacteria is by
   (a) Formation of gametes (b) Endosperm formation
   (c) Conjugation (d) Zoospore formation
2. Assertion: (A) The human ovum is surrounded by primary, secondary and tertiary membranes.
   Reason: (R) The human ovum is surrounded by vitelline membrane, zona pellucida, corona radiata, theca externa, theca interna and graafian follicle
   (a) Both (A) and (R) are true and (R) explains (A)
   (b) Both (A) and (R) are true and (R) does not explain (A)
   (c) Both (A) and (R) are false
   (d) (A) is true but (R) is false
3. Which one of the following is true regarding human embryo?
   (a) Testes are the derivative of endoderm
   (b) Liver develops from mesoderm
   (c) Brain is the derivative of ectoderm
   (d) Parathyroid glands are the derivative of mesoderm
4. Which one of the following is correctly matched?
   (a) Copper T - Disturbs ovulation
   (b) Saheli - Suppresses sperm motility
   (c) Tubectomy - Prevents ejaculation
   (d) Lippes's loop – Disturbs endometrium growth
5. Find out true and false statements from the following:
   (i) A nitrogen base linked with a hexose sugar at carbon number one forms nucleotide.
   (ii) Adenine combines with thymine and cytosine combines with guanine. It is known as Chargaff's rule.

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(iii) The discontinuous method of synthesis of DNA fragments in the leading strand is called Okazaki fragments.

(iv) Polycistronic structural gene is seen in prokaryotes.

(a) (i) and (ii) are true; (iii) and (iv) are false

(b) (i) and (iv) are false; (ii) and (iii) are true

(c) (ii) and (iv) are true; (i) and (iii) are false

(d) (i), (iii) and (iv) are true; (ii) is false

6. Match the following and find the correct answer:

i) Malaria - A. Epidermophyton

ii) Pneumonia - B. Rhino virus

iii) Ringworm - C. Streptococcus

iv) Common cold - D. Plasmodium

a. i. (D), ii. (C), iii. (A), iv. (B)
b. i. (D), ii. (B), iii. (C), iv. (A)
c. i. (B), ii. (C), iii. (D), iv. (A)
d. i. (B), ii. (A), iii. (D), iv. (C)

7. ELISA is mainly used for

a) Detection of mutations (b) Detection of pathogens

(c) Selecting animals having desired traits (d) Selecting plants having desired traits

8. As per 2017 statistics the higher per capita emitter of carbon dioxide in the world is

(a) USA (b) China (c) Qatar (d) Saudi Arabia

SECTION- II

Note: Answer any four of the following in one or two sentences. 4 x 2 = 8

9. Define plasmotomy.
10. Write the symptoms of Down's syndrome.
11. What is meant by Red Data book?
12. What is inhibin?
13. State Allen's rule.
14. What is meant by biomagnification?

SECTION- III

Note: Answer any three of the following questions. Q. No. 19 is compulsory. 3 x 3 = 9

15. Write the process of budding in hydra.
16. Differentiate between somatic cell therapy and germline cell therapy.
17. PCR technique is a useful tool in early diagnosis of COVID -19. How?
18. Give any three reasons for the loss of biodiversity.
19. How will you help your friend (who is a drug addict) to come out of drug addiction?

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SECTION- IV

IV. Note: Answer all the questions in detail. 2×5 = 10

20.(a) Describe the process of spermatogenesis. (OR)

(b) Explain the role of mRNA, rRNA and tRNA in protein synthesis.

21. (a) Write the role of innate immunity in prevention of diseases. (OR)

(b) Which is called as industrial alcohol? Briefly explain its preparation.

ANSWER KEY

8 x 1= 8

1. c. Conjugation
2. c. Both (A) and (R) are false
3. c. Ectoderm
4. d. Disturbs endometrial growth
5. c. (ii) and (iv) are true; (i) and (iii) are false
6. a. i. (D), ii. (C), iii. (A), iv. (B)
7. b. Detection of pathogens
8. b. China

SECTION – II

Note: Answer any four of the following questions.		4 x 2 = 8
9.	Plasmotomy is the division of multinucleated parent into many multinucleate daughter individuals with the division of nuclei. Nuclear division occurs later to maintain normal number of nuclei. Ex. Opalina and Pelomyxa (Giant Amoeba).	1 1
10.	Severe mental retardation Defective development of the central nervous system Increased separation between the eyes Flattened nose Ears are malformed (any two points)	2 × 1 = 2
11.	Red Data book or Red List is a catalogue of taxa facing risk of extinction. IUCN - International Union of Conservation of Nature and Natural Resources, which is renamed as WCU - World Conservation Union (Morges Switzerland) maintains the Red Data book.	2
12.	The stratified epithelium of the seminiferous tubule is made of cells called Sertoli cells or nurse cells. They secrete a hormone, inhibin, which isinvolved in the negative feedback control of sperm production.	2
13.	Allen's rule says that, warm blooded animals, living in colder climates, tend to have shorter limbs, ears and other appendages when compared to the members of the same species in warmer climates.	2

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<table>
<tr><td>14.</td><td>When non-degradable substances enter the food chain, they do not get metabolized or broken down or expelled and instead get transferred up the tropic levels of the food chain. During this process they show an increase in concentration which is referred as biomagnification.</td><td>2</td></tr>
<tr><td colspan="3">SECTION –III</td></tr>
<tr><td colspan="3">Note: Answer any three of the following questions. Question No. 19 is compulsory.
3 x 3 = 9</td></tr>
<tr><td>15.</td><td>In hydra a small elevation appears on the surface of the body by increase in the number of ectodermal cells. The bud contains an interior lumen in continuation with the parent’s gastro- vascular cavity. The bud enlarges, develops a mouth and a circle of tentacles at its free end. When fully grown, the bud constricts at the base and finally separates from the parent body and leads an independent life.</td><td>3</td></tr>
<tr><td>16.</td><td><table><tr><td>Somatic cell gene therapy</td><td>Germline gene therapy</td></tr><tr><td>Therapeutic genes are transferred into the somatic cells.</td><td>Therapeutic genes are transferred into the germ cells.</td></tr><tr><td>Genes are introduced into bone marrow cells, blood cells, skincells etc.,</td><td>Genes are introduced into eggsand sperms.</td></tr><tr><td>Will not be inherited to later generations.</td><td>Heritable and passed on to later generations.</td></tr></table></td><td>3 × 1 = 3</td></tr>
<tr><td>17.</td><td>The PCR test takes a sample of ribonucleic acid (RNA) and “amplifies” it. Amplifying RNA helps to make even small traces of the COVID-19 virus visible in the test sample. Even if there is a small trace of the virus in the sample, the PCR test will detect it.</td><td>3</td></tr>
<tr><td>18.</td><td>Habitat loss, fragmentation, and destruction (Affects 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 cuttingof trees, overfishing, hunting, mining)
Intensive agriculture and aquacultural practices
Natural disasters
Co -extinction (any three points)</td><td>3 × 1 = 3</td></tr>
</table>

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19.	I will advise my friend, to have a better group of friends to avoid such harmful drugs and alcohol in order to avoid peer pressure. To go in for counselling To go in for de-addiction and rehabilitation programmes	3 × 1 = 3
	SECTION - IV	
Note: Answer all questions.		2 × 5 = 10
20. (a)	In the first stage of spermatogenesis, the spermatogonia become modified and enlarged to form primary spermatocytes which are diploid with 23 pairs i.e., 46 chromosomes. Some of the primary spermatocytes undergo first meiotic division to form two secondary spermatocytes which are haploid with 23 chromosomes each. The secondary spermatocytes undergo second meiotic division to produce four haploid spermatids. The spermatids are transformed into mature spermatozoa (sperms) by the process called spermiogenesis. Schematic representation of spermatogenesis	4 1
	(OR)	
20. (b)	There are three types of RNA molecules involved in expressing the genes encoded within DNA of a cell. They are mRNA, rRNA and tRNA. mRNA - The genetic information necessary for protein synthesis is present in the form of triplet codons in DNA. This information in DNA for the synthesis of proteins from amino acids is copied to mRNA. This step is called transcription, which is essential for the synthesis of protein. rRNA- The ribosomes are the structures in which protein synthesis takes place. ribosomal RNA (rRNA) molecules form the core of a cell's ribosomes. Within the ribosome, the rRNA molecules direct the catalytic steps of protein synthesis - getting amino acids together to make a protein molecule. For this reason, rRNA is sometimes called a ribozyme or catalytic RNA. tRNA- The transfer RNA molecule of a cell acts as a vehicle that picks up the amino acids scattered through the cytoplasm and also reads specific codes of mRNA molecules. Hence, during translation tRNA molecule carries amino acids one by one to the ribosomal complex (the site of protein synthesis) as per the codons present on mRNA.	5
21. (a)	<table><tr><td>Type of immunity</td><td>Mechanism</td></tr><tr><td colspan="2">1. Anatomical barriers</td></tr></table>	

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	Skin	Prevents the entry of microbes. Its acidic environment (pH 3-5) retards the growth of microbes.	5
	Mucus membrane	Mucus entraps foreign microorganisms and competes with microbes	
	2. Physiological barriers		
	Temperature	Normal body temperature inhibits the growth of pathogens.	
	Low pH	Acidity of gastric secretions (HCl) kills most ingested microbes.	
	Chemical mediators	Lysozyme acts as antibacterial agent and cleaves the bacterial cell wall. Interferons induce antiviral state in the uninfected cells. Complementary substances produced from leucocytes lyse the pathogenic microbes or facilitate phagocytosis.	
	3. Phagocytic barriers		
	Specialized cells	Monocytes, neutrophils and tissue macrophages phagocytose, and digest whole microorganisms.	
	4. Inflammatory barriers		
	Tissue damage and infection	Induce leakage of vascular fluid, containing chemotactic signals like serotonin, histamine and prostaglandins. They influx the phagocytic cells into the affected area. This phenomenon is called diapedesis.	

(OR)

21. (b)	Ethanol is called as industrial alcohol. Bacteria such as Zymomonas mobilis and Sarcina ventriculi are also involved in ethanol production. The principal substrates for the commercial production of industrial alcohol include molasses or corn, potatoes and wood wastes. The process of ethanol production starts by milling a feed stock. It is followed by the addition of dilute or fungal amylase (enzyme) from *Aspergillus* to break down the starch into fermentable sugars. Yeast is then added to convert the sugars to ethanol, which is then distilled off to obtain ethanol which is up to 96 percent in concentration.	1 4