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						

COMMON HALF YEARLY EXAMINATION - 2022-23

ZOOLOGY

Time allotted: 3 Hours **Max. Marks: 70**

ANSWER KEY

PART- 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. 15 x 1 = 15

1. a. Honey bees
2. d. Sponges and amphibians
3. a. A and R are true. R is the correct explanation of A
4. a. Johannsen
5. b. inhibiting release of FSH and LH
6. d. Saccharomyces cerevisiae - Ethanol
7. a. 14
8. d. A and C
9. b. Transcription
10. a. Monocyte
11. a. Subunit recombinant vaccines
12. b. Article 21
13. d. Diapause
14. a. Fungal
15, c. Extinction

PART – II

Note: Answer any six of the following questions. Question No. 24 is compulsory. 6 x 2 = 12

16.	Severe mental retardation Defective development of the central nervous system Increased separation between the eyes Flattened nose Ears are malformed Mouth is constantly open and the tongue protrudes. (any two points)	2 x 1 = 2

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<table>
<tr><td>17.</td><td>Acclimatization refers to the physiological changes that occur in the body of animals in response to environmental changes.</td><td>2</td></tr>
<tr><td>18.</td><td>Though gametes are not produced during conjugation, union of two individual paramecium occurs. In which they exchange certain amount of nuclear material (DNA) and then get separated. Hence this type of reproduction is called sexual reproduction.</td><td>2</td></tr>
<tr><td>19.</td><td>Ideonella sakaiensis is currently being tried for recycling of PET plastics. These bacteria use PETase and MHETase enzymes to breakdown PET plastic into terephthalic acid and ethylene glycol.</td><td>2</td></tr>
<tr><td>20.</td><td>Sudden appearance of vestigial organs in highly evolved organisms is called atavism.
Example, presence of tail in a human baby is an atavistic organ.</td><td>1
1</td></tr>
<tr><td>21.</td><td>Cryopreservation refers to freezing of embryos. It provides an additional opportunity for pregnancy, through a Frozen Embryo Transfer (FET), without undergoing another ovarian stimulation and retrieval.</td><td>2</td></tr>
<tr><td>22.</td><td><table><tr><th>B-cells</th><th>T- cells</th></tr><tr><td>B- cells stay in bone marrow until they mature.</td><td>T- cells leave bone marrow and mature in Thymus gland.</td></tr><tr><td>B- cells when receive antigens, multiply to become plasma cells, which in turn produce antibodies.</td><td>T- cells do not produce antibodies, but recognize antigen presenting cells and destroy them.</td></tr></table></td><td>2 × 1 =2</td></tr>
<tr><td>23.</td><td>AQI- Air Quality Index
PAN- Peroxyacetyl Nitrate
NRCP- National River Conservation Plan
BOD- Biological Oxygen Demand</td><td>4 × ½ = 2</td></tr>
<tr><td>24.</td><td>With the following symptoms, we can find out if a child is affected with ascariasis:
Abdominal pain, vomiting, headache, anaemia, irritability diarrhoea, stunted growth etc. (any four symptoms)</td><td>4 × ½ = 2</td></tr>
</table>

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PART - III		
Note: Answer any three of the following questions. Question No. 33 is compulsory.		6 x 3 = 18
25.	Ecological sanitation (Ecosan) is a sustainable system for handling human excreta by using dry composting toilets. Ecosan toilets not only reduce waste water generation but also generate the natural fertilizer from recycled human excreta, which forms an excellent substitute for chemical fertilizers.	2×1½ =3
26.	Absence of menstruation is called amenorrhoea. If menarche does not appear till the age of 18, it is called primary amenorrhoea. Absence of menstruation for over three consecutive months is secondary amenorrhoea.	1 1 1
27.	RNA has an additional hydroxyl group, which makes it less stable and more reactive. But in DNA, absence of this additional hydroxyl group makes it less reactive and more stable than RNA.	3
28.	PCPNDT- Preconception and Prenatal Diagnostic Technique Act is enacted to ban the identification of sex and to prevent the use of prenatal diagnostic techniques for selective abortion.	3
29.	Development of an egg into a complete individual without fertilization is known as parthenogenesis. Two types. Natural and artificial. Natural is of two types. Complete parthenogenesis parthenogenesis56is the only form of reproduction, as individuals are represented by females only. Ex. Whiptail lizard Incomplete parthenogenesis both sexual reproduction and parthenogenesis occur. Ex. In honeybees Artificial parthenogenesis development of unfertilized egg into a complete individual by physical or chemical stimuli. e.g.,Annelid and sea urchin eggs.	1 1 1

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30.	It is a corrective therapy given to a person born with a hereditary disease. This process involves the transfer of a normal gene into a person's cells that carry one or more mutant alleles. Adenosine Deaminase Deficiency (ADA)	2 1
31.	Natality is equivalent to birth rate. It may be expressed as number of organisms born per female per unit time. The crude birth rate of a population can be calculated using the formula: $\text{Birth rate (b)} = \frac{\text{Number of births per unit time}}{\text{Average population}}$ Mortality can be expressed as a loss of individuals in unit time or death rate. The crude death rate of a population can be calculated, using the formula: $\text{Death rate (d)} = \frac{\text{Number of deaths per unit time}}{\text{Average population}}$	2×1½ =3
32.	Antibiotic resistance develops when bacteria are able to defeat the drug designed to kill or inhibit their growth. Antibiotic resistance is accelerated by the misuse and over use of antibiotics, as well as poor infection prevention control.	3
33.	It is practically possible to prevent someone from using drugs and alcohol. Effectively dealing with peer pressure Seeking help from parents and peers Education and counselling Looking for danger signs Seeking professional and medical assistance	3
	Part – IV	
Note: Answer all questions.		5 × 5 = 25
34. (a)	It helps in gender identification. It is used to detect the chromosomal aberrations like deletion, duplication, translocation, nondisjunction of chromosomes. It helps to identify the abnormalities of chromosomes like aneuploidy.	5 × 1 = 5

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	It is also used in predicting the evolutionary relationships between species. Genetic diseases in human beings can be detected by this technique.	
	(OR)	
34. (b)	Limit generation: Limiting the generation of waste is the first and most important consideration in managing radioactive wastes. Dilute and disperse: For wastes having low radioactivity, dilution and dispersion are adopted. Delay and decay: It is an important strategy, because much of the radioactivity in nuclear reactors and accelerators is very short lived. Concentrate and confine process: The waste is contained in corrosion resistant containers and transported to disposal sites. Leaching of heavy metals and radionuclides from these sites is a problem of growing concern.	1 1 1 2
35. (a)	Schematic representation of spermatogenesis and oogenesis (diagrams)	2×2½=5
	(OR)	
35. (b)	It is a triplet codon. 61 codons code for amino acids. 3 codons do not code for any amino acid and called stop codons. It is universal, meaning that all living systems use the same triplet codon to direct the synthesis of proteins from amino acids. For example, phenyl alanine in all cells of all organisms is coded by a triplet codon UUU. It is non- overlapping, meaning that the same letters are not used for two different codons. It is comma less, meaning that the message would be read directly from one end to the other i.e., no punctuation is needed between two codes. It is a degenerating code, meaning that more than one triplet codon could code for a specific amino acid. It is non- ambiguous meaning that one codon codes for one amino acid only. The code is always read in a fixed direction i.e., from 5' → 3' direction called polarity.	5 × 1 = 5

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	AUG acts as an initiator codon and also codes for the amino acid methionine. UAA, UAG and UGA are termination codons and are also known as non – sense codons. (Any five points)	
36. (a)	In their experiment, a mixture of gases was allowed to circulate over electric discharge from a tungsten electrode. A small flask of water was kept boiling and the steam emanating from it was made to mix with the mixture of gases (ammonia, methane and hydrogen) in the large chamber that was connected to the boiling water. The steam was condensed to form water which ran down the 'U' tube. At the end of a week Glycine, alanine, beta alanine and aspartic acid were identified in the liquid. Thus, Miller's experiments proved the possibility of synthesis of organic compounds by abiogenesis. Diagram	4 1
	(OR)	
36. (b)	The human immunodeficiency virus belongs to the genus Lentivirus. When observed under the electron microscope, HIV is seen as a spherical virus, 100-120 nm in diameter, containing a dense core surrounded by a lipoprotein envelope. The envelope has glycoprotein (gp) spikes termed gp 41 and gp 120. At the core, there are two large single stranded RNA. Attached to the RNA are molecules of reverse transcriptase. It also contains enzymes like protease and ribonuclease. The core is covered by a capsid made of proteins. This is followed by another layer of matrix proteins. Diagram	4 1
	(OR)	
37. (a)	When a mosquito carrying sporozoites in its salivary gland bites a person, sporozoites enter into liver cells through blood stream. Sporozoites undergo asexual fission and become merozoites, which then enter into RBCs.	

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	Merozoites develop into trophozoites. Then enter into ring stage. The nucleus of the trophozoites divide asexually to produces schizont. Schizont divides to produce mononucleated merozoites. Sometimes merozoites differentiate into mega gametocytes and micro gametocytes. Diagram	4 1
	(OR)	
37. (b)	Earthworms, land Planarians secrete a mucus coating to maintain a moist situation for burrowing, coiling, respiration, etc., Arthropods have an external covering over the respiratory surfaces and well- developed tracheal systems. In vertebrate skin, there are many cellular layers besides the well protected respiratory surfaces that help in preventing loss of water. Some animals obtain their water requirement from food as partial replacement of water lost through excretion. Camels are able to regulate water effectively for evaporative cooling through the skin and respiratory system and excrete highly concentrated urine, and can also withstand dehydration up to 25% of their body weight.	5 × 1 = 5
38. (a)	This technique involves the insertion of human insulin gene on the plasmids of E. coli. A small portion of the plasmid DNA from a bacterium is cut using restriction enzyme. Human insulin producing gene is removed and fused with plasmid DNA. Now this recombinant DNA is inserted into a bacterial cell. The recombinant bacterium multiplies in a fermentation tank. From this recombinant bacterium human insulin gene is extracted and purified. The polypeptide chains are synthesized as a precursor called pre- pro insulin, which contains A and B segments linked by a third chain (C) and preceded by a leader sequence.	4

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	The leader sequence is removed after translation and the C chain is excised, leaving the A and B polypeptide chains. This recombinant insulin is termed as Humulin. Diagram	1
	(OR)	
38. (b)	In shifting or Jhum cultivation, plots of natural tree vegetation are burnt away.The cleared patches are farmed for 2-3 seasons, after which their fertility is reduced that, crop production is no longer profitable. The farmer then abandons this patch and cuts down a new patch offorest trees elsewhere for crop production. When vast areas are cleared and burnt, it results in loss of forest cover, pollution, and discharge of CO_2 which in turn results in loss of habitat and climate change which has an impact on the biodiversity of that regions.	5

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