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

BIOLOGY

Time allotted: 3 Hours

Part -II (BIO-ZOOLOGY) (Max. Marks:35)

BIO- ZOOLOGY ANSWER KEY

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

1. d. gametogenesis → fertilization → cleavage→ gastrulation → organogenesis
2. c. The genetic material is double stranded RNA
3. b. Recessive character carried by X chromosome
4. a. It is the genetic material present universally in all organisms
5. c. Devonian
6. d. African sleeping sickness - flea
7. c. Both (A) and (R) are false
8. d. Amazon rain forest

SECTION – II

Note: Answer any four of the following questions.		4 x 2 = 8
9.	Development of an egg into a complete individual without fertilization is known as parthenogenesis. Ex. Honey bee, aphis, gall fly. (Any two examples)	1+1
10.	Female foeticide refers to 'aborting the female in the mother's womb'. Female infanticide is 'killing the female child after her birth'.	1 1
11.	In a population let's say that 'A' allele has frequency (p) of 0.3 and 'a' allele has a frequency (q) of 0.7. Then p + q = 1.	1 1

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	The genotype frequency can be estimated by Hardy Weinberg equation. $(p + q)^2 = p^2 + 2pq + q^2$	
12.	When cancer cells from the first formed tumour spread to other parts of the body and give rise to secondary tumour, it is called metastasis.	2
13.	Antibodies are immunoglobulin (Ig) protein molecules synthesized on exposure to antigen that can combine specifically with the antigen. Antibiotics are chemical substances produced by microorganisms which can kill or retard the growth of other disease-causing microbes even in low concentration.	1 1
14.	A sacred grove or sacred woods are any grove of trees that are of special religious importance to a particular culture. Sacred groves feature in various cultures throughout the world.	2
	SECTION –III	
Note: Answer any three of the following questions. Question No. 19 is compulsory.		3 x 3 = 9
15.	Nutrient rich waste water must be checked for the amount of nutrients present in it. Pre- treatment of such water is essential before it is discharged into water bodies like pond or lake. More trees must be planted on the river banks that they will absorb the nutrients present in runoff water.	3×1=3
16.	Eurytherms manage extreme hot conditions by thermoregulation. Ex. Camels are able to regulate water effectively for evaporative cooling through the skin and respiratory system. Excrete highly concentrated urine. Withstand dehydration up to 25% of their body weight.	1 1 1
17.	The binding of sperm with zona pellucida of the egg induces the acrosomal reaction in which the sperm releases hyaluronidase into the zona pellucida. Breakdown of the zona pellucida by these enzymes allows the sperm to reach the plasma membrane of	1 1

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	the egg. Immediately, after which cortical granules form a barrier called fertilization membrane which prevents polyspermy.	 1
18.	Involuntary jerking of the body and progressive degeneration of the nervous system. Gradual mental and physical deterioration. The patients with this disease usually die between the age of 35 and 40.	1 1 1
19.	The transfer RNA, (tRNA) molecule of a cell acts as a vehicle. Picks up the amino acids scattered through the cytoplasm. Reads specific codes of mRNA molecules.	1 1 1
	Part – IV	
Note: Answer all questions.		**2×5 = 10**
20. (a)	Human ovum is non-cleidoic, alecithal and microscopic in nature. Its cytoplasm called ooplasm contains a large nucleus called the germinal vesicle. The ovum is surrounded by three coverings namely an inner thin transparent vitelline membrane, middle thick zona pellucida and outer thick coat of follicularcells called corona radiata. Between the vitelline membrane and zona pellucida is a narrow perivitelline space. Diagram and labelling	½ ½ 1½ ½ 1+1
	(OR)	
20. (b)	Replication begins at 'origin of replication'. Helicases and topoisomerases (DNA gyrase) unwind and pull apart the strands, forming a Y-Shaped structure called the replication fork. Replication is continuous in template strand and is known as the leading strand. Replication is discontinuous in coding strand and known as the lagging strand. The discontinuously synthesized fragments of the lagging strand (Okazaki fragments) are joined by the enzyme DNA ligase.	4+1

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	As they move away in both directions, newly synthesized complementary nucleotides are paired with the existing nucleotides on the parent strand and covalently bonded together by DNA polymerase. Formation of new strand requires a primer (a short stretch of RNA) for initiation. The RNA primer is ultimately removed leaving a gap in the newly synthesized DNA strand. Finally, all the gaps are sealed by the enzyme DNA ligase. Diagram	
21. (a)	An antibody molecule is Y shaped structure that comprises of two identical light chains (L) of molecular weight 25,000 Da and two identical heavy chains (H) of molecular weight 50,000 Da 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. Hence, an antibody is represented as $H_2 L_2$. Each chain (L and H) has two terminals. They are C - terminal (Carboxyl) and amino or N-terminal. They have variable (V) region at one end and a much larger constant (C) region at the other end. Diagram	1 1 1 1 1
	(OR)	
21. (b)	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 Hybridization between native and non-native species and loss ofnative species Natural disasters (Tsunami, forest fire, earthquake, volcanoes) Industrialization, Urbanization, infrastructure development, Transport – Road and Shipping activity, communication towers,dam construction, unregulated	5

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	tourism and monoculture are common areas of specific threats **Co-extinction (Any five points)**	