SECOND YEAR HIGHER SECONDARY MODEL EXAMINATION– FEBRUARY - 2024

226

PART – III

BIOLOGY (BOTANY & ZOOLOGY)

SCORING KEY (UNOFFICIAL)

	PART -A BOTANY	
Qn. No.	**Scoring indicators**	**Marks**
	PART - I	
	Answer any 3 questions from 1 – 4. Each carry 1 score	
1.	Emasculation.	1
2.	Respiration.	1
3.	Restriction enzymes.	1
4.	Rosie.	1
	PART – II	
	Answer any 9 questions from 5 – 15. Each carry 2 scores	
5.	(a) – Plumule (b) – Cotyledons (c) – Radicle (d) – Root cap	½ x 4 = 2
6.	This is a genetic mechanism that prevents self-pollen (Pollen from the same flower or plant) from fertilising the ovules by inhibiting its germination or pollen tube growth in the pistil / Inability of the pollen grains to grow on the stigma of the same flower or the flowers of the same plant / Self incompatibility prevents self-pollen from fertilizing the ovule / Inhibition of self-pollen germination / Inhibition of pollen tube growth of self-pollen /Genetic mechanism to prevent self-pollination.	2
7.	Chemical composition of detritus, temperature, soil p^H and soil moisture.	1 + 1 = 2
8.	(a) Gel Electrophoresis is used for the isolation and separation of DNA fragment. (b) Agarose.	1 + 1 = 2

Qn. No.	Scoring indicators	Marks
9.	a) Direct injection of recombinant DNA (rDNA) into the nucleus of an animal cell is called microinjection / It is the rDNA transfer method for animal cell. b) Bombardment of plant cell with high velocity micro particle of gold or tungsten coated with DNA is called biolistics / It is the rDNA transfer method for plant cell.	1 + 1 = 2
10.	(a) N – Population density at time t / Population size r – Intrinsic rate of natural increase K – Carrying capacity (b) – Resources of a given habitat can support the maximum possible number of individual, beyond which no further growth is possible. This limit is called carrying capacity.	½ x 4 = 2
11.	According to the law when two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior one will be eliminated eventually.	2
12.	(a) The rate of biomass production through photosynthesis is called productivity. (b) 1. The plant species inhabiting an area. 2. Environmental factors. 3. Availability of nutrients. 4. Photosynthetic capacity of plants. (Any two factors)	1 + 1 = 2
13.	(a) Animals whose DNA is manipulated to possess and express a foreign gene are called transgenic animals. (b) Used to study the normal physiology and development (effect) of a gene. Used to understand the role of a gene in the development of a disease. Transgenic animals (mice) are used in testing the safety of vaccines They are used for toxicity or safety testing of chemicals. Transgenic animals are used for the production of biological products. (Any two uses)	1 + 1 = 2
14.	1st Trophic level – Trees 2nd Trophic level – Cow 3rd Trophic level – Wolf 4th Trophic level – Lion	½ x 4 = 2
15.	(a) GEAC - Genetic Engineering Approval Committee (b) Organisation set up by Government of India to make decisions for producing GM organism and related research / Safety of introducing GM-organisms for public services.	1 + 1 = 2

PART – III

Answer any 3 questions from 16 – 19. Each carry 3 scores

Qn. No.	Scoring indicators	Marks
16.	(i) (a) – Natality / Birth rate (b) – Immigration (ii) Mortality is the number of deaths in the population during a given period / number of deaths in a population / Death rate.	1 + 1 + 1 = 3
17.	(a) – Transfer of pollen grains from the anther to the stigma of a pistil is termed as pollination. (b) • Insect pollinating flowers are very large, colorful, fragrant and rich in nectar. • Small flowers present in cluster to make them conspicuous. • Flower pollinated by flies and beetles secrete foul odour. • Nectar and pollen grains are the usual floral rewards for insects. • In some species, flower provide floral rewards by providing safe places to lay eggs. (Any four adaptions)	1 + 2 = 3
18.	(a) Polymerase Chain Reaction (b) Denaturation, Annealing, and Extension (c) Artificially synthesized small oligonucleotide sequence complimentary to the regions of DNA.	1 +1+1 = 3
19.	(a) Collection of methods that allow correction of a defective gene diagnosed in embryo/ child is called gene therapy. (b) Due to the deletion of the gene for adenosine deaminase enzyme. (c) 1. Enzyme replacement therapy. 2. Bone marrow transplantation. 3. Gene therapy. (Any one method with explanation)	1 +1 +1 = 3

	PART -B ZOOLOGY	
Qn. No.	Scoring indicators	Marks
	PART - I	
	Answer any 3 questions from 1 – 6. Each carry 1 score	
1.	(a) – Mice live / live (b) – Mice die / dead	1
2.	Species-Area relationship graph.	1
3.	(a) – Ovulation. (b) – Ampullary-isthmic junction / Ampullary region / Ampulla.	1
4.	Incomplete dominance.	1
5.	IUD's All others are natural methods of Contraception / Birth control method Or IUD's are inserted into the uterus for contraception / Intra Uterine Devices	½ + ½ = 1
	PART – II	
	Answer any 9 questions from 6 – 16. Each carry 2 scores	
6.	(a) – Assisted Reproductive Technologies (b) – IVF / ET / ZIFT / IUT / GIFT / ICSI / AI / IUI (Any two term or its expansion)	1 + 1 = 2
7.	(a) – Phenyl ketonuria / PKU. (b) – Haemophilia	1 + 1 = 2
8.	(a) – Affected female / Affected individuals. (b) – Mating between relatives / Consanguineous mating. (c) – Male / Normal male. (d) – Sex unspecified.	½ x 4 = 2
9.	(a) – Bacterial Artificial Chromosome. (b) – Translation.	1 + 1 = 2

<table>
<tr><th>Qn. No.</th><th>Scoring indicators</th><th>Marks</th></tr>
<tr><td>10.</td><td>Avoid sex with unknown partners/multiple partners.
Always use condoms during coitus.
Use disposable syringe and needles.
Proper monitoring of blood before blood transfusion.
Control drug abuse.
(Any two relevant points)</td><td>½ x 4 =2</td></tr>
<tr><td>11.</td><td>(a) A – Trophoblast
B – Inner cell mass.
(b) Trophoblast – Help in attachment of blastula to the endometrium / Help in implantation.
Inner cell mass – Gets differentiated into embryo / develop into embryo.</td><td>½ x 4 =2</td></tr>
<tr><td>12.</td><td>(a) – Turner’s Syndrome.
(b) – Sterile female / Ovaries are rudimentary.
(c) – 44A + XXY
(d) – Down’s Syndrome.</td><td>½ x 4 =2</td></tr>
<tr><td>13.</td><td>Australopithecines → Homo habilis → Homo erectus → Neanderthal man</td><td>½ x 4 =2</td></tr>
<tr><td>14.</td><td><table><tr><th>A</th><th>B</th></tr><tr><td>Physical barrier</td><td>Skin</td></tr><tr><td>Physiological barrier</td><td>Acid in stomach</td></tr><tr><td>Cellular barrier</td><td>PMNL</td></tr><tr><td>Cytokine barrier</td><td>Interferon</td></tr></table></td><td>½ x 4 =2</td></tr>
<tr><td>15.</td><td>(a) Hardy-Weinberg Principle / Hardy-Weinberg Equilibrium.
(b) Gene flow or gene migration / genetic drift / mutation / genetic recombination / natural selection.
(Any three factors)</td><td>½ x 4 = 2</td></tr>
<tr><td>16.</td><td>(a) – Streptokinase.
(b) – Trichoderma polysporum.
(c) – Used as Immunosuppressive agent.
(d) – Statins.</td><td>½ x 4 =2</td></tr>
</table>

PART – III

Answer any 3 questions from 17 – 20. Each carry 3 scores

Qn. No.	Scoring indicators	Marks
17.	a) Habitat loss and fragmentation, Over-exploitation, Alien species invasions, Co-extinctions (b) 1. Botanical Gardens 2. Zoological Park 3. Seed bank 4. Cryopreservation 5. Wild life safari Park 6. IVF 7. Tissue Culture (Any two methods)	1+1+1 = 3
18.	(a) Tubectomy. (b) Vasectomy. (c) CuT / Cu7 / Multiload 375. (Any two examples)	1+1+1 =3
19.	(a) – DNA fingerprinting (b) A – Digestion of DNA by restriction endonuclease enzyme. B – Separation of DNA fragments by electrophoresis. C – Hybridisation using labelled VNTR (Variable Number of Tandem Repeats) probe. D – Detection of hybridised DNA fragment by autoradiography.	1+2 =3
20.	(a) Nucleosome. (b) A – DNA. B – Histone octamer.	1+1+1 = 3