

SECOND YEAR HIGHER SECONDARY MODEL EXAMINATION- FEBRUARY - 2025**SY - 626****PART - III****BIOLOGY (BOTANY & ZOOLOGY)****SCORING KEY (UNOFFICIAL)**

PART - A		
BOTANY		
Qn. No.	Scoring indicators	Marks
PART - I		
Answer any 3 questions from 1 – 5. Each carry 1 score		
1.	Agarose.	1
2.	Stratification.	1
3.	c / Filiform apparatus.	1
4.	Carrying capacity.	1
5.	Genetic Engineering Approval Committee.	1
PART - II		
Answer any 9 questions from 6 – 16. Each carry 2 scores		
6.	a) – PCR / Polymerase Chain Reaction. b) – <i>Taq</i> polymerase.	1 + 1 = 2
7.	A	B
	a) Commensalism	2) Orchid on a tree
	b) Predation	3) Cactus and moth
	c) Competition	4) Abingdon tortoise and goat
	d) Parasitism	1) Loranthus
		$\frac{1}{2} \times 4 = 2$
8.	Energy at a lower trophic level is always more than at a higher level / when energy flow from one trophic level to the next level some energy is lost as heat at each step. / It always follows law of 10% / Only 10% of the energy is transferred to each trophic level from the lower trophic level. (Any 1 point give full score)	1 + 1 = 2
9.	X – Proinsulin Y – Insulin / A peptide C Peptide.	1 + 1 = 2

Qn. No.	Scoring indicators	Marks				
10.	Bt toxin protein is produced as inactive protoxin in bacterial cell, so it does not kill bacteria.	2				
11.	Leaching Catabolism Humification Mineralisation	$\frac{1}{2} \times 4 = 2$				
12.	a) Origin of replication (<i>ori</i>) / Selectable markers / Cloning Sites (Any two) b) pBR322 (Not given as artificial vector in NCERT Text book)	2				
13.	<table border="1"> <thead> <tr> <th>Grazing Food Chain</th> <th>Detritus Food Chain</th> </tr> </thead> <tbody> <tr> <td>Starts with producers / Green plants. It is the major channel of energy flow in aquatic ecosystem. Producers or Plants belongs to first trophic level.</td> <td>Starts with detritus / dead organic matter. It is the major channel of energy flow in terrestrial ecosystem. Dead organic matter belongs to first trophic level.</td> </tr> </tbody> </table> <p style="text-align: right;">(Any one point in each)</p>	Grazing Food Chain	Detritus Food Chain	Starts with producers / Green plants. It is the major channel of energy flow in aquatic ecosystem. Producers or Plants belongs to first trophic level.	Starts with detritus / dead organic matter. It is the major channel of energy flow in terrestrial ecosystem. Dead organic matter belongs to first trophic level.	1 + 1 = 2
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14.	(a) A – Mortality / (D) B – Emigration / (E) b) Natality and Immigration / I & B	1 + 1 = 2				
15.	True fruit- Fruit developed from the ovary. Eg:- Mango / Coconut / Pea (relevant example) False fruit – Fruit developed from thalamus / Fruit developed from the flower parts other than ovary. Eg:- Apple / Cashew / Strawberry (Examples for each type give half score)	1 + 1 = 2				
16.	<i>Vallisneria</i> / <i>Hydrilla</i> / <i>Zostera</i> (Any one example) Adaptations Pollen grains are long, ribbon like and carried passively inside the water / Pollen grains are protected from wetting by mucilaginous covering / Female flower have long stalk / In <i>Vallisneria</i> pollen grains released into the surface of water and carried to the stigma by air current /In sea grass the flowers remains submerged. (Any three feature)	$\frac{1}{2} + 1\frac{1}{2} = 2$				

PART – III

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

Qn. No.	Scoring indicators	Marks
17.	<p>a) – GMO An organism (bacteria, fungi, plants or animals) whose genetic material is altered is called Genetically Modified Organism.</p> <p>RNAi - RNA interference technology / Silencing or inhibition of translation of specific mRNA by complementary double stranded RNA (dsRNA) is called RNAi technology .</p> <p>Bioreactors – A large vessels that can be used for large scale production of Products by continuous culture method. / Bioreactors are vessels in which raw materials are biologically converted into specific products.</p>	1 + 1 + 1 = 3
18.	<p>a) A – Primary Consumer B – Tertiary Consumer</p> <p>b) First trophic level – Grass, Tree Second trophic level – grasshopper, cow Third trophic level – Birds, fishes, wolf Fourth trophic level – Man, Lion</p>	1 + 2 = 3
19.	<p>Direct Method / Chemical method In chemical method bacterial cells are treated with divalent cation such as Ca^{2+} to increase cell permeability. Then these cells are treated with rDNA on ice followed by heat shock at 42°C and then placed again in ice. The chemical method made the host cell competent to take rDNA.</p> <p>Microinjection 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.</p> <p>Biolistics or Gene gun 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.</p> <p>Use of disarmed Pathogen Vector Disarmed pathogen vector when allowed to infect the cell transfer the recombinant DNA into the host.</p> <p style="text-align: right;">(Any three methods)</p>	1 + 1 + 1 = 3
20.	<p>a) Syngamy Triple fusion</p> <p>b) Primary Endosperm Nucleus / PEN / Primary Endosperm Cell Primary endosperm cell develops into endosperm / Develops into nutritive endosperm tissue</p>	1 + 2 = 3

PART - B
ZOOLOGY

Qn. No.	Scoring indicators	Marks
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PART - I

Answer any 3 questions from 1 – 6. Each carry 1 score

1.	Progesterone	1
2.	IMR – Infant Mortality Rate MMR – Maternal Mortality Rate	1
3.	b / ABO blood group in human.	1
4.	A – Transcription B – Translation	$\frac{1}{2} + \frac{1}{2} = 1$
5.	<i>Salmonella typhi</i>	1

PART - II

Answer any 9 questions from 6 – 16. Each carry 2 scores

6.	A	B	$\frac{1}{2} \times 4 = 2$
	a) LH surge	3) Ovulation	
	b) Leydig cell	4) Androgen	
	c) Ampullary region	1) Fertilisation	
	d) Sertoli cell	2) Nutrition to the spermatid	
7.	a) – Symbiotic associations between fungi and roots of higher plants. b) – Fungal symbiont in these associations absorbs phosphorus from soil and passes it to the plant / develop resistance to root-borne pathogens / tolerance to salinity and drought / Help an overall increase in plant growth and development. <div style="text-align: right;">(Any one benefit)</div>		1 + 1 = 2
8.	a) – Theory of Chemical Evolution / Oparin – Haldane Theory b) – CH ₄ , NH ₃ , H ₂ O, H ₂ .		1 + 1 = 2
9.	a) – One of the parental DNA strand was conserved in newly formed DNA molecule after replication / Newly synthesised DNA molecule have one parental and one newly synthesised stand b) – DNA dependent DNA polymerase / DNA Polymerase. c) – S - phase.		1 + 1 = 2

Qn. No.	Scoring indicators	Marks								
10.	A – Citric acid B – <i>Trichoderma polysporum</i> C – Lactic acid D – <i>Monascus purpureus</i>	$\frac{1}{2} \times 4 = 2$								
11.	a) The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation. b) <table border="1" data-bbox="240 531 1341 1482"> <thead> <tr> <th data-bbox="240 531 792 596">Homologous organ</th> <th data-bbox="792 531 1341 596">Analogous organ</th> </tr> </thead> <tbody> <tr> <td data-bbox="240 596 792 989"> <ul style="list-style-type: none"> ➤ Organs that have similar structure but having different function. ➤ Homology indicates common ancestry. ➤ Homologous organ represents the divergent evolution. </td> <td data-bbox="792 596 1341 989"> <ul style="list-style-type: none"> ➤ The organs that are having similar function but differ in structure and origins are called analogous organs. ➤ Analogous organ represents the convergent evolution. </td> </tr> <tr> <td data-bbox="240 989 792 1415"> Examples <ul style="list-style-type: none"> • Fore limbs of whale, bat, human and cheetah. • Hearts of Vertebrates • Brain of Vertebrates • Tendril in Cucurbits & Thorn in Bougainvillea </td> <td data-bbox="792 989 1341 1415"> Examples <ul style="list-style-type: none"> • Wings of Butterfly and Birds. • Eye of Octopus and Mammals. • Flippers of Penguins and Dolphins • Tuber of Potato and Sweet Potato. </td> </tr> <tr> <td colspan="2" data-bbox="240 1415 1341 1482" style="text-align: center;">(Any one difference or example in each)</td> </tr> </tbody> </table>	Homologous organ	Analogous organ	<ul style="list-style-type: none"> ➤ Organs that have similar structure but having different function. ➤ Homology indicates common ancestry. ➤ Homologous organ represents the divergent evolution. 	<ul style="list-style-type: none"> ➤ The organs that are having similar function but differ in structure and origins are called analogous organs. ➤ Analogous organ represents the convergent evolution. 	Examples <ul style="list-style-type: none"> • Fore limbs of whale, bat, human and cheetah. • Hearts of Vertebrates • Brain of Vertebrates • Tendril in Cucurbits & Thorn in Bougainvillea 	Examples <ul style="list-style-type: none"> • Wings of Butterfly and Birds. • Eye of Octopus and Mammals. • Flippers of Penguins and Dolphins • Tuber of Potato and Sweet Potato. 	(Any one difference or example in each)		1 + 1 = 2
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12.	a) – Cu-T. b) – Cu ions released by Cu-T suppress sperm motility and the fertilising capacity of sperms / Increases the phagocytosis of sperms.	1 + 1 = 2								
13.	a) – Pregnancy b) – Placenta c) – Human Placental Lactogen (hPL) / estrogen / progesterone (Any two)	1 + 1 = 2								

14.	a) – Nucleosome b) – Histone octamer c) Euchromatin – Loosely packed / Light stainable / Transcriptionally active Heterochromatin – Densely packed / Dark stainable / Transcriptionally inactive (Any two differences)	$\frac{1}{2} \times 4 = 2$
15.	a) Hardy-Weinberg Principle / Hardy-Weinberg Equilibrium. b) Gene flow or gene migration / genetic drift / mutation / genetic recombination / natural selection. (Any two factors)	$1 + 1 = 2$
16.	a) – 5' UACGUACGUACG 3'. (Coding strand in question paper is wrongly given) b) – Promoter , Structural gene, Terminator.	$1 + 1 = 2$
PART – III		

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

Qn. No.	Scoring indicators	Marks
17.	a) ZIFT - Zygote Intra Fallopian Transfer Transfer of zygote or early embryo with up to 8 blastomeres. Zygote/Embryo is transferred into the fallopian tube. IUT - Intra Uterine Transfer Embryo transfer with more than 8 blastomeres. Embryo is transferred into the uterus. b) Helpful to get rid of unwanted pregnancies either due to casual unprotected intercourse or failure of the contraceptive used during coitus or rapes. If continuation of the pregnancy could be harmful or even fatal either to the mother or to the foetus or both.	$1 + 2 = 3$
18.	a) Down's Syndrome, Trisomy of 21 / (45A + XX or 45A + XY) / 47 chromosomes b) Short statured / Furrowed tongue / mentally retarded / Palm is broad with characteristic palm crease. (Any two symptoms)	$1 + 2 = 3$
19.	a) – Alexander von Humboldt b) – S – Species richness C – Y -intercept A – Area Z – Slope of the line / Regression coefficient	$1 + 2 = 3$
20.	a) Alec Jeffreys b) VNTR – Variable Number of Tandem Repeats c) Used in forensic studies / Evolutionary biology / Genetic biodiversity studies / Parental dispute (Any relevant two uses)	$1 + 2 = 3$