

**SECOND YEAR HIGHER SECONDARY EXAMINATION- MARCH - 2023****SY - 526****PART - III****BIOLOGY (BOTANY & ZOOLOGY)****SCORING KEY (UNOFFICIAL)**

	<b>PART -A</b>										
	<b>BOTANY</b>										
Qn. No.	Scoring indicators	Marks									
<b>PART - I</b>											
Answer any 3 questions from 1 – 5. Each carry 1 score											
1.	Perisperm	1									
2.	Fragmentation	1									
3.	Electrophoresis / Gel electrophoresis / Agarose gel electrophoresis	1									
4.	Commensalism	1									
5.	cryIAb	1									
<b>PART - II</b>											
Answer any 9 questions from 6 – 16. Each carry 2 scores											
6.	<table><tr><td><b>Grazing Food Chain</b></td><td><b>Detritus Food Chain</b></td></tr><tr><td>Starts with producers.</td><td>Starts with detritus / dead organic matter.</td></tr><tr><td>It is the major channel of energy flow in aquatic ecosystem.</td><td>It is the major channel of energy flow in terrestrial ecosystem.</td></tr><tr><td>Producers or Plants belongs to first trophic level.</td><td>Dead organic matter belongs to first trophic level.</td></tr></table> <p>(Any two points in each type) or (Flow chart showing DFC and GFC give 1 Score)</p>		<b>Grazing Food Chain</b>	<b>Detritus Food Chain</b>	Starts with producers.	Starts with detritus / dead organic matter.	It is the major channel of energy flow in aquatic ecosystem.	It is the major channel of energy flow in terrestrial ecosystem.	Producers or Plants belongs to first trophic level.	Dead organic matter belongs to first trophic level.	1 + 1 =2
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7.	Pollen release and stigma receptivity are not synchronized. Anther and stigma are placed at different position. Self-incompatibility. Production of unisexual flowers. male and female flowers are present on different plant (dioecy).		½ x 4 = 2								

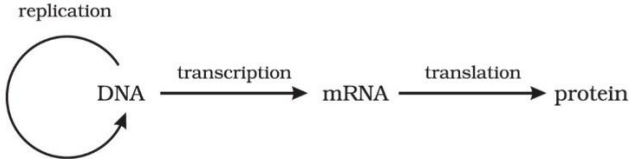
Qn. No.	Scoring indicators	Marks
8.	Bacterial cells are treated with divalent cation such as $\text{Ca}^{2+}$ to increase cell permeability. Then these cells are treated with recombinant DNA (rDNA) on ice. The cells and rDNA in ice are allowed to heat at $42^{\circ}\text{C}$ (heat shock at $42^{\circ}\text{C}$ ). The content is again cooled to ice cold.	$\frac{1}{2} \times 4 = 2$
9.	(a) – Funicle (b) – Micropyle (c) – Embryo sac / Female gametophyte (d) – Chalaza / chalazal pole	$\frac{1}{2} \times 4 = 2$
10.	(a) – Taq polymerase (b) – <i>Thermus aquaticus</i> .	$1 + 1 = 2$
11.	The rate of biomass production is called productivity It may be primary productivity and secondary productivity Factors affecting primary productivity 1. The plant species inhabiting an area. 2. Environmental factors. 3. Availability of nutrients. 4. Photosynthetic capacity of plants.	$1 + 1 = 2$
12.	The Bt toxin is produced by the bacteria as inactive protoxin. Alkaline $\text{P}^{\text{H}}$ of insects' gut convert inactive protoxin into active toxin. Active Bt toxin binds to the gut epithelium and causes cell lysis leading to insect's death.	$1 + 1 = 2$
13.	(a) – Mutualism (b) – Parasitism (c) – Commensalism (d) – Mutualism	$\frac{1}{2} \times 4 = 2$
14.	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%.	2
15.	Genetically Modified Organism (GMO) / An organism (bacteria, fungi, plants or animals) whose genetic material is altered is called Genetically Modified Organism. <ul style="list-style-type: none"> <li>○ Made crops tolerant to abiotic stress (cold, drought, salt &amp; temperature).</li> <li>○ Develop pest resistance.</li> <li>○ Helped to produce reduce post-harvest losses.</li> <li>○ Enhanced nutritional value of food. Eg :- Vitamin 'A' enriched rice</li> <li>○ Increased efficiency of mineral usage by plants.</li> </ul> <p>(Any one merit)</p>	$1 + 1 = 2$

Qn. No.	Scoring indicators	Marks
16.	(a) – (a) - Exponential growth / J shaped curve (b) - Logistic growth / Verhulst-Pearl Logistic Growth / Sigmoid Growth / S shaped curve (b) – K – Carrying capacity	1 + 1 = 2

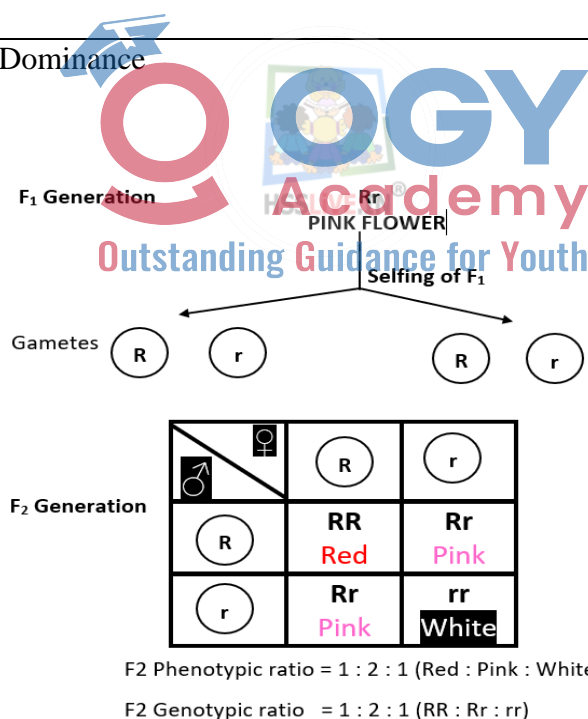
### PART – III

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

17.	Eli Lilly Company prepared DNA sequences corresponding to A and B chain of insulin. A and B Chain DNA were introduced in plasmid of E.coli to produce the A and B chains. Chain A and B were produced separately. Chain A and B were extracted and combined by creating disulphide bonds	3
18.	Plants produces enormous amount of pollen. Flowers with well exposed stamens. Large feathery stigma to trap air-borne pollen grains. Most wind pollinated flowers contain single ovule in one ovary and numerous flowers packed into an inflorescence e.g. corn cob. Pollen grains are light and non-sticky. (Any three peculiarities)	1+1+1= 3
19.	(i) (a) – Mortality / Death rate / D (b) – Emigration / E (ii) Natality / Birth rate / B and Immigration / I. (iii) The number of births during a given period or birth rate during a given period.	1+1+1= 3
20.	<p>✱ <b>I<sup>st</sup> letter (E)</b> - First letter in the genus of the bacteria from which the enzyme is derived.</p> <p>✱ <b>II<sup>nd</sup> &amp; III<sup>rd</sup> letters (co)</b> - First two letters from the species of the organism.</p> <p>✱ <b>IV<sup>th</sup> letter (R)</b> - First letter of the strain of bacteria.</p> <p>✱ <b>Roman number (I)</b> - Order of isolation.</p> <p>OR</p> <p><b>E - Escherichia      co - coli      R - RY 13 strain      I- First order of isolation</b></p>	1+1+1= 3

<b>PART -B</b>		
<b>ZOOLOGY</b>		
Qn. No.	Scoring indicators	Marks
<b>PART - I</b>		
Answer any 3 questions from 1 – 6. Each carry 1 score		
1.	<p>Fallopian tube.</p> <p>Fallopian tube is the part of Duct system of / reproductive part of female.</p> <p>OR</p> <p>All others are part of male reproductive system.</p>	$\frac{1}{2} + \frac{1}{2} = 1$
2.	<p>Flow of genetic information flows from DNA → mRNA → Protein</p> <p>OR</p> 	1
3.	(C) / <i>Saccharomyces cerevisiae</i>	1
4.	(C) / Malaria – Plasmodium.	1
5.	Zoological Park, Botanical Garden.	$\frac{1}{2} + \frac{1}{2} = 1$
<b>PART - II</b>		
Answer any 9 questions from 6 – 16. Each carry 2 scores		
6.	<p>(a) 1. Human chorionic gonadotropin / hCG 2. Human placental lactogen /hPL 3. Estrogen 4. Progestogens (Any two hormones)</p> <p>(b) It facilitates the supply of oxygen and nutrients to the embryo. It helps to remove CO<sub>2</sub> and excretory wastes produced by the embryo</p>	1 + 1 = 2
7.	<p>(i) A – Progesterone B – Estrogen.</p> <p>(ii) The remaining parts of the Graafian follicle transform as the corpus luteum. The corpus luteum secretes large amounts of progesterone which is essential for maintenance of endometrium.</p>	1 + 1 = 2
8.	<p>IUD's - Intra Uterine Devices / These devices that are inserted by doctor or expert nurse into the uterus through vagina.</p> <p>Copper releasing IUDs . Eg :- CuT, Cu7 &amp; Multiload 375</p> <p>Hormone releasing IUDs . Eg :- Progestasert, LNG -20</p> <p>( Any one example in each)</p>	1 + 1 = 2

Qn. No.	Scoring indicators		Marks
9.	<b>Genetic Disorders</b>	<b>Genetic Reasons</b>	$\frac{1}{2} \times 4 = 2$
	Klinefelter's Syndrome	Presence of an extra X chromosome in males (XXY)	
	Down's Syndrome	21 <sup>st</sup> Trisomy.	
	Turner's Syndrome	Lack of one 'X' chromosome in female (XO).	
	Phenylketonuria	Due to autosomal recessive trait.	
10.	(i) A – Terminator B - Coding strand (ii) It determines the base sequence in mRNA / DNA-dependent RNA polymerase move along this strand to produce mRNA.		1 + 1 = 2
11.	(A) The organs that are having similar function but differ in structure and origins. (B) (i) / Eyes of octopus and mammals (iii) / Wings of butterfly and birds		1 + 1 = 2
12.	A – Australopithecines B – <i>Homo habilis</i> C – <i>Homo erectus</i> D – <i>Homo sapiens</i>		$\frac{1}{2} \times 4 = 2$
13.	<b>Active Immunity</b>	<b>Passive Immunity</b>	1 + 1 = 2
	<ul style="list-style-type: none"> <li>Antibodies are produced in the host body when pathogen is entered into body.</li> <li>Active immunity is slow in action.</li> <li>It shows the property of memory.</li> <li>Long term in action.</li> </ul>	<ul style="list-style-type: none"> <li>Ready-made antibodies are directly injected into the body.</li> <li>Active immunity is fast in action.</li> <li>Memory property is absent.</li> <li>Short term in action.</li> </ul>	
14.	Avoid undue pressure in adolescence Proper education & counselling Providing help from parents & peer group Looking for the danger sign (Relevant points related to these points)		$\frac{1}{2} \times 4 = 2$
15.	(A) - <i>Trichoderma polysporum</i> . Used as Immunosuppressive agent. (B) - <i>Streptococcus</i> . Used as clot buster (Removing the clot).		1 + 1 = 2

Qn. No.	Scoring indicators	Marks
16.	<p>(A) – Vertebrates – Fishes Invertebrates – Insects</p> <p>(B) – Genetic Diversity, Species diversity, Ecological diversity</p>	1 + 1 = 2
<b>PART – III</b>		
<b>Answer any 3 questions from 17 – 20. Each carry 3 scores</b>		
17.	<p>(A) Sexually Transmitted Infections /Sexually Transmitted Diseases (STD's) OR Diseases or infection which are transmitted through sexual intercourse.</p> <p>(B) Gonorrhoea / Syphilis / Genital herpes / Chlamydia / Genital warts / Trichomoniasis / Hepatitis - B / AIDS (HIV Infection) (Any Two examples)</p> <p>(C) Avoid sex with unknown partners. Always use condoms during coitus. In case of doubts, consult a qualified doctor. Early detection and complete treatment are needed.</p>	1+1+1 = 3
18.	<p>(A) – Incomplete Dominance</p> <p>(B) –</p>  <p>F2 Phenotypic ratio = 1 : 2 : 1 (Red : Pink : White)</p> <p>F2 Genotypic ratio = 1 : 2 : 1 (RR : Rr : rr)</p>	1+2 = 3

19.	<p>(i) A – Habitat loss and fragmentation B – Over-exploitation.</p> <p>(ii) <b>Alien species invasion</b> - New species introducing into a geographical region is called exotic species or alien species. It cause decline or extinction of indigenous species.</p> <p>Eg : - Nile Perch introduced into Lake Victoria in East Africa lead to extinction of Cichlid fish in the lake.</p> <p>Introduction African Cat fish (<i>Clarias gariepinus</i>) causes threat to indigenous catfishes in our rivers.</p> <p>Invasive weeds like Lantana, Carrot grass (<i>Parthenium</i>) &amp; Water hyacinth (<i>Eicchornia</i>) causes environmental damage and threat to native species</p> <p><b>Co-extinction</b> - When a species becomes extinct, the plant and animal species associated with it also become extinct.</p> <p>Eg :- plant and its pollinator, Host and its parasites.</p> <p>(Any one example in each type)</p>	1+1+1 =3
20.	<p>Streptococcus pneumonia bacterium has two strains</p> <p>S strain (smooth strain/Virulent) : Has mucopolysaccharide coat that cause Pneumonia.</p> <p>R strain (rough strain/Non-virulent) : Mucous coat absent and did not cause Pneumonia.</p> <p><b>Steps in Griffith's experiment</b></p> <p>S-strain → Injected into mouse → Mouse dies of pneumonia.</p> <p>R-strain → Injected into mouse → Mouse lives</p> <p>Heat killed S-strain → Injected into mouse → Mouse lives</p> <p>Heat killed S-strain + Live R-strain → Injected into mouse → Mouse dies</p> <p>Griffith's postulated that some 'transforming principle' transferred from the heat-killed S-strain to R-strain and make them virulent.</p> <p>(Steps in experiment – full score)</p>	3