

SECOND YEAR HIGHER SECONDARY MODEL EXAMINATION- FEBRUARY -**2023****SY - 2226****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.	(c) / tapetum	1
2.	Rosie	1
3.	Food web	1
4.	(a) / Exonuclease	1
5.	Amensalism	1
PART - II		
Answer any 9 questions from 6 – 16. Each carry 2 scores		
6.	They keep prey populations under control. Predators also help in maintaining species diversity in a community.	1 + 1 = 2
7.	(a) Removal of anthers from the flower bud before the anther dehisces is called emasculation. (b) It prevent self pollination.	1 + 1 = 2
8.	The Bt toxin is produced by the bacteria as inactive protoxin. Alkaline P ^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.	½ x 4 = 2
9.	(a) Pyramid of energy. (b) Energy at a lower trophic level is always more than at a higher level / when energy flows from one trophic level to the next level some energy is lost as heat at each step. / It always follows law of 10%.	1 + 1 = 2
10.	Separated DNA fragment can be visualised as orange coloured band by exposing to UV light after staining with Ethydium Bromide.	1 + 1 = 2

Qn. No.	Scoring indicators		Marks
11.	(a) Enzyme linked immuno-sorbent assay (b) Antigen-antibody interaction		1 + 1 = 2
12.	A – Endosperm B – Scutellum C – Plumule D – Radicle		$\frac{1}{2} \times 4 = 2$
13.	Gross primary productivity	Net primary productivity	1 + 1 = 2
	The rate of production of organic matter during photosynthesis.	Gross primary productivity minus respiration losses. $GPP - R = NPP$	
14.	B – Natality / Birth rate I – Immigration D – Mortality / Death rate E – Emigration		$\frac{1}{2} \times 4 = 2$
15.	(a) – Restriction enzymes (b) – They are used to cut at specific position of the DNA.		$\frac{1}{2} \times 4 = 2$
16.	A	B	$\frac{1}{2} \times 4 = 2$
	Fragmentation	Breakdown of detritus into smaller particles	
	Leaching	Water soluble inorganic nutrients go down into the soil	
	Catabolism	Bacterial and fungal enzymes degrade detritus into simpler inorganic substances.	
	Mineralisation	Formation of inorganic nutrients from humus	

PART – III

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

17.	(a) A – Exponential growth B – Logistic growth / Verhulst-Pearl Logistic Growth / exponential growth / Sigmoid Growth (b) K – Carrying capacity r – Intrinsic rate of natural increase	$1\frac{1}{2} + 1\frac{1}{2} = 3$
18.	Pollen grains are sticky. 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 three uses)	1+1+1= 3

Qn. No.	Scoring indicators	Marks
19.	(a) – PCR / Polymerase Chain Reaction (b) – Used for in vitro synthesis of multiple copies of the gene or DNA/ Amplification of gene. (c) – Taq Polymerase	1+1+1= 3
20.	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 three uses)	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.	Ampulla / ampullary-isthmic junction	1
2.	Syphilis, Chlamydiasis	$\frac{1}{2} + \frac{1}{2} = 1$
3.	Fishes	1
4.	(a) – Untranslated regions (b) – Variable Number of Tandem Repeats	$\frac{1}{2} + \frac{1}{2} = 1$
5.	Brain	1

PART - II

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

6.	(a) Structural and functional connection between embryo and maternal body is called placenta / Chorionic villi and uterine tissues together form the placenta (b) 1. Human chorionic gonadotropin / hCG 2. Human placental lactogen /hPL 3. Estrogen 4. Progesterone (Any two hormones)	1 + 1 = 2
7.	Habitat loss and fragmentation, Over-exploitation, Alien species invasions, Co-extinctions.	$\frac{1}{2} \times 4 = 2$
8.	(a) Organs that has similar structure but having different function . (b) Convergent evolution.	1 + 1 = 2
9.	(a) - <i>Trichoderma polysporum</i> . Used as Immunosuppressive agent. (b) - <i>Monascus purpureus</i> . Blood cholesterol lowering agents.	$\frac{1}{2} \times 4 = 2$
10.	(A) - Tubectomy (B) - Non-medicated IUDs	1 + 1 = 2

Qn. No.	Scoring indicators	Marks										
11.	(a) – Male / Unaffected male (b) – Female / Unaffected female (c) – Mating (d) – Mating between relatives / consanguineous mating.	$\frac{1}{2} \times 4 = 2$										
12.	(a) – Nucleosome (b) – (A) - DNA (B) - Histone octamer	1 + 1 = 2										
13.	(A) – Skin / mucous coating (B) – Physiological Barrier (C) – PMNL-neutrophils / Monocytes / natural killer type lymphocytes / Macrophages (D) – Cytokine Barriers.	$\frac{1}{2} \times 4 = 2$										
14.	(a) AB blood group genotype - $I^A I^B$ O blood group genotype - $i i$ (b) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Male</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">Female</td> <td style="text-align: center;"></td> <td style="text-align: center;">$I^A i$ A Group</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">$I^B i$ B Group</td> </tr> </table>	Male			Female		$I^A i$ A Group			$I^B i$ B Group	1 + 1 = 2	
Male												
Female		$I^A i$ A Group										
		$I^B i$ B Group										
15.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Scientists</th> <th style="width: 50%;">Contribution</th> </tr> </thead> <tbody> <tr> <td>George Gamow</td> <td>Genetic code</td> </tr> <tr> <td>Alec Jeffreys</td> <td>DNA finger-printing</td> </tr> <tr> <td>Frederick Griffith</td> <td>Transformation experiment</td> </tr> <tr> <td>Taylor and colleagues</td> <td>DNA replication</td> </tr> </tbody> </table>	Scientists	Contribution	George Gamow	Genetic code	Alec Jeffreys	DNA finger-printing	Frederick Griffith	Transformation experiment	Taylor and colleagues	DNA replication	$\frac{1}{2} \times 4 = 2$
Scientists	Contribution											
George Gamow	Genetic code											
Alec Jeffreys	DNA finger-printing											
Frederick Griffith	Transformation experiment											
Taylor and colleagues	DNA replication											
16.	(A) – Ramapithecus (B) – Homo erectus (C) – Neanderthal man (D) – Homo sapiens (Not given in question)	$\frac{1}{2} \times 4 = 2$										
PART – III												
Answer any 3 questions from 17 – 20. Each carry 3 scores												
17.	(a) A – Morula b – Blastocyst (b) – Inner cell mass (c) – Blastocyst embedded in the endometrium of the uterus is called implantation.	1+1+1 = 3										

Qn. No.	Scoring indicators	Marks						
18.	(a) – (A) – Transcription (B) – Translation (b) – Purines - Adenine & Guanine. Pyrimidines - Uracil & Cytosine. (c) – Sugar-phosphate.	1+1+1 =3						
19.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" data-bbox="256 422 1354 485">(a) – Carcinogens. (b)</td> </tr> <tr> <td data-bbox="256 485 808 800"> Benign Tumors <ul style="list-style-type: none"> The cancer, which are localized to a particular tissue, are called benign tumor. They are non-invasive and cause little damage. </td> <td data-bbox="808 485 1354 800"> Malignant Tumors <ul style="list-style-type: none"> Malignant tumors consist of mass of proliferative cells. The cells can invade to other tissues. Show metastasis. </td> </tr> <tr> <td colspan="2" data-bbox="256 800 1354 968">(c) Techniques like radiography (use of X-rays), CT (computed tomography) MRI (magnetic resonance imaging). (Any two methods)</td> </tr> </table>	(a) – Carcinogens. (b)		Benign Tumors <ul style="list-style-type: none"> The cancer, which are localized to a particular tissue, are called benign tumor. They are non-invasive and cause little damage. 	Malignant Tumors <ul style="list-style-type: none"> Malignant tumors consist of mass of proliferative cells. The cells can invade to other tissues. Show metastasis. 	(c) Techniques like radiography (use of X-rays), CT (computed tomography) MRI (magnetic resonance imaging). (Any two methods)		1+1+1 =3
(a) – Carcinogens. (b)								
Benign Tumors <ul style="list-style-type: none"> The cancer, which are localized to a particular tissue, are called benign tumor. They are non-invasive and cause little damage. 	Malignant Tumors <ul style="list-style-type: none"> Malignant tumors consist of mass of proliferative cells. The cells can invade to other tissues. Show metastasis. 							
(c) Techniques like radiography (use of X-rays), CT (computed tomography) MRI (magnetic resonance imaging). (Any two methods)								
20.	(a) (A) – Down’s Syndrome (B) – Klinefelter’s Syndrome (C) – Turner’s Syndrome (b) Haemophilia, Sickle-cell anaemia, Phenylketonuria, Thalassemia, Colour Blidness (Any three disorders)	1½ + 1½ =3						