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Senior Secondary School Term II Examination, 2022

Marking Scheme – BIOLOGY (SUBJECT CODE – 044)

(PAPER CODE – 57/2/3)

General Instructions: -

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2. **“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its’ leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc may invite action under IPC.”**
3. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**
4. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
5. Evaluators will mark(\checkmark) wherever answer is correct. For wrong answer ‘X’ be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
6. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
7. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
8. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
9. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

10. A full scale of marks 0-35 has to be used. Please do not hesitate to award full marks if the answer deserves it.
11. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 30 answer books per day in main subjects and 35 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
12. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
 - Leaving answer or part thereof unassessed in an answer book.
 - Giving more marks for an answer than assigned to it.
 - Wrong totaling of marks awarded on a reply.
 - Wrong transfer of marks from the inside pages of the answer book to the title page.
 - Wrong question wise totaling on the title page.
 - Wrong totaling of marks of the two columns on the title page.
 - Wrong grand total.
 - Marks in words and figures not tallying.
 - Wrong transfer of marks from the answer book to online award list.
 - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
 - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
13. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
14. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
15. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
16. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
17. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

MARKING SCHEME
Senior Secondary School Examination TERM–II, 2022
BIOLOGY (Subject Code–044)
[Paper Code : 57/2/3]

Maximum Marks : 35

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks
SECTION—A		
1.	<ul style="list-style-type: none"> • Cyclosporin A • <i>Trichoderma polysporum</i> 	1 1 2
2.	<ul style="list-style-type: none"> • <i>Wuchereria bancrofti</i> and <i>Wuchereria malayi</i> • inflammation of the organs in which they live for many years, inflammation of lymphatic vessels of the lower limbs , deformities in genital organs <p style="text-align: right;">(any two)</p>	½ + ½ ½+½ 2
3.	<p>(a)</p> <p>(i) (I) Y, (II) X</p> <p>Note : ½ mark to be awarded if student writes either one or both parts correctly in 6(a)(i)</p> <p>(ii) • Y will show high biological diversity</p> <ul style="list-style-type: none"> • Reason : less seasonal / constant and predictable environment, more solar energy available for species diversification <p style="text-align: center;">OR</p> <p>(b)</p> <p>(i) Does not have its natural predators.</p> <p>(ii) predators act as conduits for energy transfer across trophic levels, they keep prey population under control, predators help in maintaining species diversity in a community by reducing competition among prey species, if a predator is too efficient and over exploits its prey then the prey become extinct followed by predator / predators are prudent in nature.</p> <p style="text-align: right;">(any two)</p>	½ ½ ½+½ 1 ½ + ½ 2
4.	<ul style="list-style-type: none"> • Biogas plant A • Methanogens present in the cow dung (grow anaerobically on cellulosic material), produce large amounts of methane along with carbon dioxide and hydrogen. 	1 ½+½ 2
5.	<p>Increased RBC production, decrease in the binding affinity of Haemoglobin, increase in breathing rate</p> <p style="text-align: right;">(any two)</p>	1 + 1

		2
6.	a)	
	(i) Decrease in the number of helper T –lymphocytes / weakened immunity	½
	(ii) Bacterium- <i>Mycobacterium</i> ; Parasite- <i>Toxoplasma</i>	½ ½
(iii) Enzyme Linked Immuno-sorbent Assay / Polymerase Chain Reaction	½	
	OR	
	b)	
	Increased CO content in blood, reduced the concentration of haem bound oxygen / oxygen deficiency in the body, increased incidence of cancers (of lung / urinary bladder / throat), bronchitis, emphysema, coronary heart disease, gastric ulcer, raised blood pressure, increased heart rate.	½×4
	(any four points)	
		2
SECTION—B		
7.	<ul style="list-style-type: none"> • Gel electrophoresis • Negatively charged DNA fragments (produced by restriction endonuclease) move towards anode through agarose gel, smaller fragments move further, separated fragments are stained with ethidium bromide, followed by exposure to UV radiation, extraction of DNA bands by elution. 	½
		½×5
		3
8.	(a) • Vaccine - Hepatitis B	1
	• Host – Yeast (or any other correct example)	1
	(b) (B Lymphocytes) produce an army of proteins / antibodies in blood to fight against foreign antigen.	1
		3
9.	a)	
	Paul – Ehrlich compared Airplane with ecosystem, in an airplane (ecosystem) all parts are joined together using thousands of rivets (species), if every passenger travelling in it starts popping a rivet to take home (causing a species to become extinct), it may not affect flight safety (proper functioning of ecosystem) initially, if more and more rivets are removed then the plane becomes dangerously weak over a period of time, loss of rivets on the wings (Key species that drives major ecosystem functions) is a more serious threat to flight	½ x 6
	OR	
	(b)	
	(i) Extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake	1

	(ii) carrot grass / (<i>Parthenium</i>), <i>Lantana</i> , water hyacinth / (<i>Eichhornia</i>) (or any correct example)	1 + 1
		3
10.	Sexual Stage (gametocytes) develop in RBC, gametocytes are taken by female <i>Anopheles</i> mosquito with blood meal, fertilisation and development take place in the mosquito's gut, mature infective stages (sporozoites) escape from gut, migrate to mosquito's salivary glands, when the mosquito bites another human sporozoites are injected with bite //	$\frac{1}{2} \times 6$ //
	<p>The diagram illustrates the life cycle of Plasmodium. At the top, a female mosquito bites a human hand, injecting sporozoites. Text: "When the mosquito bites another human, sporozoites are injected with bite." Below, a cross-section of a mosquito's body shows sporozoites migrating from the gut to the salivary glands. Text: "Mature infective stages (sporozoites) escape from gut and migrate to the mosquito salivary glands." In the center, a mosquito is shown biting a human hand. Text: "Fertilization and development take place in the mosquito's gut." At the bottom, a female mosquito is shown taking a blood meal from a human hand. Text: "Female mosquito takes up gametocytes with blood meal." Below this, gametocytes are shown developing in red blood cells, with labels for "Female" and "Male". Text: "Sexual stages (gametocytes) develop in red blood cells."</p>	$\frac{1}{2} \times 6$
		3
11.	(a) • Yes • Degradation of habitats by fragmentation threatens the survival of many species / mammals / birds / migratory birds which require large territories (are badly affected), leading to decline of population. (or any other relevant reason) (b) Fragments / Fragmentation	1 $\frac{1}{2} + \frac{1}{2}$ 1
		3
12.	(a) <i>cryIAb</i> (b) The ingested inactive toxin in insect get solubilise / become active due to alkaline pH of insect's gut. It binds to the surface of midgut epithelial cells and perforate the walls, causes cell swelling, lysis and ultimately kill the insect.	1 $\frac{1}{2}$ $\frac{1}{2} \times 3$
		3
SECTION—C		

13.	(a)		
	(i) • No	• Cut with same restriction endonuclease to obtain complementary sticky ends / to obtain DNA fragments with same kind of sticky ends (which can be joined together end to end)	1/2
	(ii) DNA ligase		1/2
	(iii) Cloning / Host Cloning / Gene Cloning		1
	(iv)		1
		<p>I. BamHI or SalI II. PvuI or PstI III. Ori</p> <p>(any two correct labellings)</p>	1/2 + 1/2
	(v) Codes for the proteins involved in replication of the plasmid		1
		OR	
	(b)		
(i) X cholesterol level increases Z cholesterol level decreases		1	
(ii) • In Eukaryotes • method of cellular defense		1	
(iii) • Silencing of specific mRNA due to binding of a complementary ds RNA		1	
		5	

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