

Marking Scheme Strictly Confidential (For Internal and Restricted use only) Senior Secondary Supplementary School Examination, 2026 (XIIth) SUBJECT NAME-BIOLOGY (Q.P. CODE 57(B)7)	
<u>General Instructions: -</u>	
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 Newspaper/Website, etc. may invite action under various rules of the Board and 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 due marks be awarded to them. In Class-XII, 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, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	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. If there is any variation, the same should be zero after deliberation and discussion. 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.
6	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	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.
8	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.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

11	A full scale of marks 0 to 70 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 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.
13	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 an answer. • 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/not same. • 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.
14	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.
15	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.
16	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.
17	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.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME
BIOLOGY (Subject Code – 044)
(PAPER CODE: 57B)

Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
	SECTION – A		
1.	(C) / Relaxin.	1	1
2.	(A) / Chemical components.	1	1
3.	(D) / Lysine and Arginine.	1	1
4.	(C) / <i>Australopithecines</i> .	1	1
5.	(B) / Point mutation.	1	1
6.	(D) / Unfertilised egg develops as a male (drone) by means of parthenogenesis.	1	1
7.	(D) / Increase in a whole set of chromosomes.	1	1
8.	(C) / Law of independent assortment.	1	1
9.	(A) / Rich in millions of Lactic Acid Bacteria (LAB).	1	1
10.	(C) / Random mating.	1	1
11.	(B) / Pleiotropy.	1	1
12.	(C) / B-lymphocytes.	1	1
13.	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
14.	(D) / Assertion (A) is false, but Reason (R) is true	1	1
15.	(D) / Assertion (A) is false, but Reason (R) is true	1	1
16.	(A) / Both Assertion (A) and Reason (R) are true, and Reason (R) is correct explanation of Assertion (A)	1	1
	SECTION – B		
17.	(a) (i) Immediately after implantation finger-like projections called chorionic villi appear on the trophoblast, chorionic villi and uterine tissue become interdigitated with each other and jointly form placenta. (ii) Placenta facilitates the supply of oxygen, and nutrients to the embryo, removes carbon dioxide and excretory/waste materials produced by embryo. (Any Two)	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	

	OR (b) (i) During fertilisation a sperm comes in contact with zona pellucida layer of the ovum and induces changes in the membrane that block the entry of additional sperms. (ii) • Location- Within the seminiferous tubules. • Function- They provide nutrition to the male germ cells.	1 $\frac{1}{2}$ $\frac{1}{2}$	2
18.	(a) (i) Reasons : -Communication was not easy in those days and his work could not be widely published. -His concept of genes (or factors in Mendel's words) as stable and discrete units that controlled the expression of traits and of the pair of alleles which did not blend with each other was not accepted by his contemporaries as an explanation. -His approach of using mathematics to explain biological phenomena was totally new and unacceptable to many biologists of his time. -He could not provide any physical proof for the existence of factors or say what they were made up of. (Any two points) (ii) They noted that the behaviour of chromosomes was parallel to the behaviour of genes. OR (b) (i) Morgan and his colleagues gave the experimental verification of the chromosomal theory of inheritance which led to the discovery that basis for variation that the sexual reproduction produced. (ii) -<i>Drosophila melanogaster</i> could be grown on simple synthetic medium in the labs. -A complete life cycle is about two weeks. -A single mating could produce a large number of progeny flies. -Clear differentiation of the sexes - Any other point. (Any two)	$\frac{1}{2} \times 2$ 1 1 $\frac{1}{2} \times 2$	2
19.	(a) Malaria, Filariasis. Dengue, Chikungunya, any other relevant disease (Any Two) (b) To control and eliminate vectors and their breeding places	$\frac{1}{2} \times 2$ 1	2

	Female → mature follicles (b) LH in males stimulates the Leydig cells to produce androgens or testosterone. LH surge in female stimulates rupture of Graafian follicles / release of ova / ovulation.	$\frac{1}{2}$ 1 1	3
24.	-Study of fossils (Palaeontological evidences) in different sedimentary layers indicate the geological period in which they existed / fossil study showed that life forms varied overtime/ fossil represent extinct organisms(eg Dinosaurs) -Similarities in proteins and genes performing a given function among diverse organisms gives clues to common ancestry -Embryological evidence shows that certain features seen during embryonic stage common to all vertebrates like gill slits -Anatomically dissimilar structure performing similar function like wings of birds and butterfly ie analogous organs shows convergent evolution -Anatomically similar structure performing different function eg pattern of fore limb of vertebrates (whale , bats, cheetah and human) ie homologous organs shows divergent evolution and indicates common ancestry -Any other relevant evidence. (Any three)	1x3	3
25.	Molecule: t-RNA/ transfer RNA Structure: Secondary structure of t-RNA looks like clover leaf / t-RNA is a compact molecule which look like inverted L, it has an anticodon loop that has bases complementary to the codon, it also has an amino-acid-acceptor end to bind with amino-acid. Function- t-RNAs on one end read the code on the mRNA, and on other hand bind to the specific amino acid.	$\frac{1}{2}$ $\frac{1}{2} \times 3$ $\frac{1}{2} + \frac{1}{2}$	3
26.	(a) -Bio fertilisers provide almost all the nutrients while chemical fertilizers supply only specific nutrient to soil. -Bio fertilisers do not causes environmental pollution while chemical fertilisers do cause such pollution. -or any other relevant explanation (Any Two) (b) Mycorrhiza → The fungal component of mycorrhiza absorbs phosphorus from the soil and passes it to the plant so helps in overall increase in plant growth and development.	1x2 $\frac{1}{2}$	

	Cyanobacteria → (Blue green algae) fixes atmospheric nitrogen in soil to increase soil fertility.	$\frac{1}{2}$	3
27.	-Bacterial colonies with the cloning vector-P are colourless as they are recombinants having the insert within the coding sequence of the enzyme example β-galactosidase. -Presence of the insert has resulted in insertional inactivation of the enzyme and hence do not produce any coloured colonies. -Bacterial colonies with cloning vector Q are non-recombinants that is having no insert and produce coloured colonies as the enzyme is functional/active.	1 1 1	3
28.	- It is an interaction where both the closely related species are negatively affected / It is an interaction where both the closely related species compete for the same resources that are limiting / A process in which the fitness or the intrinsic rate of increase(r) of one species is significantly lower in the presence of another species - Abingdon tortoise becomes extinct because goats introduced in island were efficient browsers. - A species whose distribution is restricted to a small geographical area because of the presence of competitively superior species is found to expand its distributional range dramatically when the competing species is experimentally removed.	1 1 1	3
SECTION – D			
29.	(a) - DNA finger printing - Alec Jeffreys (b) - Digestion of DNA into smaller fragments - Detection of hybridised DNA fragments (with radioactive probe). (c) (i) To obtain DNA and match the degree of polymorphism/To find out similarity between victim and his/her/ kin at DNA level. OR (c) (ii) Determining population and genetic diversities / evolutionary Biology/ paternity test	$\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 1	4
30.	(a) Radiography / using X-rays, CT/ Computed Tomography, MRI/ Magnetic Resonance Imaging) , or any other technique. (Any two) (b)- Benign tumors , Confined to original location and do not spread to other parts of the body	$\frac{1}{2}+\frac{1}{2}$ $\frac{1}{2}+\frac{1}{2}$	

	-Malignant tumors, mass of proliferating cells that are invading and damaging surrounding normal tissues. (c) (i) Metastasis – Cells are sloughed off from the tumor to distant places through blood. OR (c) (ii) Contact between cells inhibits their uncontrolled growth, Normal cells exhibits this phenomena	$\frac{1}{2} + \frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$	4
	SECTION – E		
31.	(a) (i) -Pollen release and stigma receptivity are not synchronised / either the pollen is released before the stigma becomes receptive or stigma becomes receptive much before the release of pollen to prevent . -Anther and stigma are placed at different position so that the pollen cannot come in contact with the stigma of the same flower . -Self incompatibility- This is a genetic mechanism and prevents self-pollen (from the same flower or other flowers of the same plant) from fertilising the ovules by inhibiting pollen germination or pollen tube growth in the pistil. -Production of unisexual flowers - In several species such as papaya male and female flowers are present on different plants that is each plant is either male or female (dioecy). This condition prevents both autogamy and geitonogamy. (Any three) (ii) -In apomictic seeds there is no segregation of characters. -Farmer can keep on using the hybrid seeds to raise new crop year after year hence is less expensive for farmers. OR (b) (i) • The signals for parturition originates from the fully developed foetus and the placenta. • -Parturition is induced by a complex neuro endocrine mechanism where fully developed foetus and the placenta induce mild uterine contractions called foetal ejection reflex, this release oxytocin which acts on the uterine muscle and causes stronger uterine contraction which further stimulates oxytocin secretion this result in stronger contraction leading to expulsion of the baby out of the uterus through birth canal. (ii) Colostrum is rich in several antibodies or IgA , provide passive immunity to the newborn babies , nutrients for bringing up healthy baby. (Any Two)	1x3 1 1 1 1x2 1x2	5

32.	(a) (i) From the diseased sugarcane one can remove meristem ,and grow it in vitro to obtain virus free-plants. (ii) <i>Bacillus thuringiensis</i> is available in sachets as dried spores which are mixed with water and sprayed into vulnerable plants, when these spores are eaten by larvae toxin is released in the gut of larvae, and the larvae gets killed / Specific Bt toxin gene were isolated from <i>Bacillus thuringiensis</i> and incorporated into the several plants such as cotton, gene code for toxic insecticidal Bt protein which exist as inactive <i>protoxins</i> but once an insect ingest the inactive toxin it is converted into an active form of toxin due to the alkaline pH of the gut which solubilise the crystals ,The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually cause death of the insect. OR (b) (i) GM plants are useful in many ways- -Genetic modification helps to make crops more tolerant to abiotic stresses (cold, drought, salt, heat). -Reduces reliance on chemical pesticides -Increases efficiency of mineral usage -Helped to reduce post harvest losses. -Enhanced nutritional value of food, e.g., golden rice, i.e., Vitamin 'A' enriched rice -Any other point. (Any Four) (ii) • Transgenic animals → Animals that have had their DNA manipulated to possess and express an extra (foreign) gene are known as transgenic animals. • Benefits : -Transgenic animals can be specifically designed to allow the study of how genes are regulated and how they affect the normal functions of the body and its development. -Study of diseases -To produce biological products -To test vaccine safety -To check for chemical safety. - or any other benefit (Any four points)	1+1 1x3 ½x4 1 ½x4	5
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33.	(a) • Comparison between the population density of a particular area at two different time will give idea whether it is flourishing or declining. • The following basic processes control the population of particular area- -Natality, refers to the number of births during a given period in the population that are added to the initial density. -Mortality, is the number of deaths in the population during a given period. -Immigration, is the number of individuals of the same species that have come into the habitat from elsewhere during the time period under consideration. -Emigration, is the number of individuals of the population who left the habitat and gone elsewhere during the time period under consideration. . OR (b) -Protection of ‘biodiversity hotspots’ which are regions with high levels of species richness and high degree of endemism. -Biosphere reserves / national/ parks sanctuaries can be made to protect of protect biodiversity rich regions. -Protection of Sacred Groves as they have rare and threatened species and religious and cultural traditions emphasising protection of nature. -Zoological parks/ botanical garden / wild life safari park to protect threatened species. -Cryopreservation – In this process gametes of threatened species or pollen grains or seeds can be preserved in viable and fertile condition at very low temperature(-196°C)	1 $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ 1x5	5