Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior Secondary School Certificate Examination, 2025
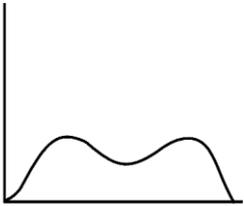## SUBJECT NAME BIOLOGY (Q.P. CODE 57/7/1)

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 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 delibration 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 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
Senior Secondary School Examination, 2025
BIOLOGY (Subject Code–044)
[Paper Code: 57/7/1]

Maximum Marks: 70

Q.No	EXPECTED ANSWER/VALUE POINTS	MARKS	TOTAL MARKS
	SECTION A		
1.	(C) / Short non-coding repetitive sequences forming a large portion of eukaryotic genome.	1	1
2.	(D) / Annealing is required to separate both the strands of template DNA.	1	1
3.	(D) / Morphine is often given to persons who have undergone surgery as a painkiller.	1	1
4.	(B) / (ii), (v), (iii), (vi), (iv), (i)	1	1
5.	(B) / XO type of chromosomes determine male sex in grasshoppers.	1	1
6.	(A) / Multicarpellary, Apocarpous	1	1
7.	(C) /	1	1
8.	(B) / Macrophages – Mucus-secreting cells that trap microbes entering into the body.	1	1
9.	(D) / Production of insulin by rDNA technique	1	1
10.	(B) / 70	1	1
11.	(A) / 8·1%	1	1
12.	(B) / ELISA – Antigen antibody interaction	1	1
13.	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
14.	(A) / Both Assertion (A) and Reason (R) are true and Reason (A) is correct explanation of Assertion (A)	1	1
15.	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	1	1
16.	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	1	1

	SECTION B		
17.	(a) Basmati rice Basmati rice -claimed as an invention by American company was derived from varieties used by Indian farmers for centuries by crossing it with semi-dwarf varieties . **OR** (b) Two purposes of GEAC : -GEAC makes decision regarding the validity of GM research, -GEAC also ensures the safety of introducing GM – organisms for public services.	1 1 1+1	 2
18.	(a) Signals for parturition arise from fully developed foetus and placenta which induce mild uterine contractions, called foetal ejection reflex, this triggers release of oxytocin from maternal pituitary, which act on uterine muscle and causes stronger uterine contractions. **OR** (b) (i) Menstrual cycle ceases / menopause occur around 50 years of age. (ii) During oogenesis Meiosis I and II are unequal divisions which form one large cell and a smaller polar body / The unequal cell formation will ensure that the large cell has more cytoplasm and more nutrient reserve for better survival of the zygote. Meiosis I and II are equal divisions in spermatogenesis.	½x4 1 ½ ½	 2
19.	(a) *Dryopithecus* / *Ramapithecus* (**Any one primate**) (b) Tanzania/ Ethiopia (**Any one place**) (c) *Australopithecines* (d) *Homo erectus*	 ½x4 	 2
20.	(a) • The human body produces antibodies against the vaccine which would neutralise the pathogenic agents during actual infection, Vaccines also generate memory B and T cells. • Vaccination will prevent occurrence of diseases by quickly recognising the pathogen and producing antibodies hence making society disease free. **OR** (b) Mucus coating of the gastrointestinal tract/ Acid in the stomach /saliva in mouth (**Any two barriers**)	 ½+½ 1 1+1	 2

21.	(a) Klinefelter's syndrome	½	
	(b) Development of breasts or Gynaecomastia / underdeveloped masculine character/ sterility/ tall stature with feminised character.	½	
	(c) Aneuploidy/ Non disjunction or Failure of segregation of chromatids during cell division results in gain of extra X chromosome in male / trisomy of sex chromosome.	1	2

SECTION C

22.	(a) Oral Pills Merits – Effective with less side effects/reversible/ cost effective/ user friendly.	½	
	Demerits – Have side effects when taken for a long time/ Pills if not taken and not repeated in a particular pattern may fail to prevent conception/wrong usage may promote conception	½	
	Surgical Method : Merits – Highly effective / Block gamete transport	½	
	Demerits – Not reversible / Can affect health if not performed in hygienic conditions. (b)IUD's prevent conception by -Increase phagocytosis of sperms. -Some suppress sperm motility and fertilizing capacity of sperms by releasing Cu^{++} ions. - Hormone releasing IUD's make uterus unsuitable for implantation and cervix hostile to sperms. (**Any two points**)	½ ½+½	
			3
23.	(a)This is adaptive radiation leading to divergent evolution.	½	
	Example – Many varieties of Darwin's finches on the same island arose from the original seed-eating finches with altered beaks enabling them to become insectivorous and vegetarian finches / A number of marsupials different from each other evolved from an ancestral stock but all within the Australian island /or any other relevant example.	1	
	(b) - Example-Evolution of Placental mammals and Australian Marsupials or any other corresponding example of these categories respectively. - Convergent evolution.	1 ½	3
24.	(a) Lysine – Serine – Proline – Tyrosine AAC UCC CCC UAC (b) Lysine – Proline – Proline – Tyrosine	1 1	

	(c) UUG AGG GGG AUG / UUG GGG GGG AUG	1	
			3
25.	Typhoid – Sustained high fever 39-40°C/ stomach-pain/ constipation.	1	
	Pneumonia- severe problems in respiration/in severe cases the lips and fingernails may turn grey to bluish in colour/ chills /cough	1	
	Malaria- If chills and high fever occurs in every 3 – 4 days.	1	3
26.	(a) Animals that have their DNA manipulated to possess and express an extra or foreign gene are known as transgenic animals.	1	
	(b)(i)Vaccine safety – Transgenic mice are being developed for use in testing the safety of vaccines before they are used on humans. Transgenic mice are being used to test the safety of the polio vaccine.	1	
	(ii)Biological products – Transgenic cow-Rosie produced human protein enriched milk(2.4 gram per litre).The milk contains human alpha-lactalbumin and was nutritionally a more balanced product for human babies than natural cow milk or any other example.	1	3
27.	(a)Large number of plants can be grown in short period of time, useful where sexual reproduction is not possible, plants without seeds can be multiplied, every plant has same genetic makeup. **(Any two advantages)**	½+½	
	(b)Any part of the plant or explant is grown in a test tube under sterile conditions, in nutrients medium (containing sucrose, vitamins, inorganic salts,amino acids, growth regulators like auxin and cytokinin etc)	½+½	
	(c)Banana, Apple, Tomato, etc. **(Any two food plants)**	½+½	3
28.	In an aquatic ecosystem-Grazing food chain (GFC).	½	
	In a terrestrial ecosystem-Detritus food chain (DFC).	½	

Differences –

Grazing Food Chain	Detritus food chain
Transfer of energy starts from producers in a food chain.	Transfer of energy starts from detritus /decomposing organic matter.
More energy flows through this.	Less amount of energy flows through this .

Energy obtained from Sun	Energy obtained from dead organic matter
Major conduit of energy in aquatic system	Major conduit of energy in terrestrial system

(**Any two differences**)

1x2

3

SECTION D

| 29.	(a) • Sewage treatment plant • used to treat sewage water before it can be released into water body.	½ ½	
	(b)Air helps in growth of flocs (aerobic bacteria along with fungal filaments), which decompose organic matter in the sewage using oxygen.	1+1	
	(c)(i) Bacterial 'flocs' settle down to form activated sludge. <div align=center>**OR**</div> (c) (ii)BOD is directly related to the measure of the organic matter present in water/ Greater the BOD more is the polluting potential	1 1	
			4
30.	(a) A – Geitonogamy B – Autogamy	½ ½	
	(b) -Anthers and stigma to be close to each other in a bisexual flower cleistogamous flower / closed flower / Pollen release and stigma receptivity at the same time <div align=center>**(Any two conditions)**</div>	1+1	
	(c)(i)Advantage → Assured seed set /no dependence on pollinators / pure breed can be obtained. Disadvantage → No genetic variation / Inbreeding depression <div align=center>**OR**</div> (c) (ii) • *Oxalis/ Viola* or common pansy/ *Commelina* . • Some flowers do not open at all /cleistogamy/ closed flower hence show autogamy.	½ ½ ½ ½	4

	SECTION E		
31.	(a) -It should be able to generate its replica. -Be chemically and structurally stable. -Provide scope for slow changes(mutation) required for evolution. -Able to express itself in the form of 'Mendelian Characters'. DNA is double-stranded whereas RNA is single-stranded, DNA has thymine instead of uracil which is present in RNA and thus DNA is more stable, DNA has 2'-H group whereas RNA has 2'-OH group at every nucleotide which is reactive and easily degrades RNA, RNA is also catalytic, both RNA and DNA can mutate but RNA mutates faster than DNA. **(Any Two)** Based on above points DNA molecule is preferred as an ideal genetic material . **OR** (b) (i) Polygenic Inheritance-Inheritance of a trait that is controlled by three or more genes / the phenotype reflects contribution of all alleles (three or more) and effect of each allele is additive. Pleiotropy – When a single gene shows multiple phenotypic expressions. (ii) Dominance – In heterozygous pair of gene dominant allele is expressed over the recessive allele/ F1 progeny resemble either of the two parents which is dominant. Codominance – In a pair of genes when both alleles express themselves/ F1 generation(one of the progeny) resembles both the parents. Incomplete dominance – When in heterozygous state none of the allele is able to express itself and phenotype is in between/ Phenotype of F1 progeny is in between the two parent. **Correct differences explained with the help of cross should be evaluated**	½x4 1x2 1 1 1 1 1 1	5
32.	(a) (i) A – Spermatozoa B – Spermatid /Spermatozoa C – Sertoli cells D – Spermatogonium (ii) Secondary spermatocyte – 23 chromosomes Spermatid – 23 chromosomes (iii) Spermiogenesis – Process by which spermatids are transformed into spermatozoa.	½X4 ½+½ 1	

|			
	Spermiation – Process by which sperm had their head embedded in Sertoli cells are released from seminiferous tubules.	1	
	OR		
	(b)		
	(i) P-Megaspore mother cell Q-Megaspores (four megaspores)	½ ½	
	(ii) (I)Meiosis. (II) • Only one cell • Monosporic development	½ ½ ½	
	(III) Three free nuclear division	½	
	(IV) The mature female gametophyte has 3 cells at micropylar end – Egg apparatus (two synergids and one egg cell) with thickenings called filiform apparatus in synergids, three cells at chalazal end – Antipodals, large central cell with two polar nuclei, so it is 8-nucleated and 7-celled.	½x4	
			5
33.	(a) (i)Alien species invasion – when alien species are introduced unintentionally or deliberately some of them turn invasive and cause decline or extinction of indigenous species. I.Nile Perch – In Lake Victoria in East Africa Nile Perch caused extinction of 200 species of cichlid fish.	1 1	
	II. *Lantana* and *Eichhornia* – Caused environmental damage and threat to native species. III.*Clarias gariepinus* – African catfish introduced for aquaculture purposes poses a threat to indigenous catfishes in our rivers.	½ ½	
	(ii) Regions with high levels of species richness, high degree of endemism have been declared as biodiversity hotspots to conserve biodiversity.	½+½	
	In India – Indo-Burma , Himalaya ,Western Ghats and Sri Lanka **(Any two regions)**	½+½	

OR

(b)   (i) $dN/dt = rN \left[\dfrac{K - N}{K} \right]$

1

(ii)

Sigmoid growth curve

1
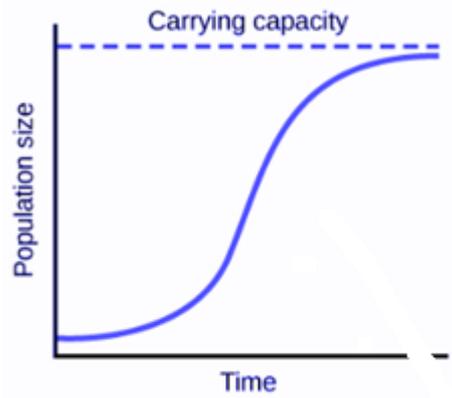
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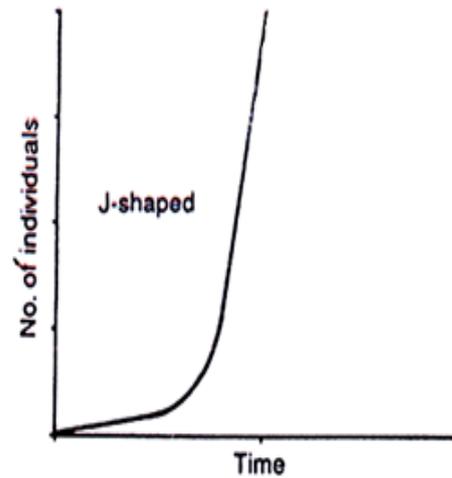
J-shaped growth curve

1

(iv)
-Logistic Growth curve / Sigmoid growth curve is more realistic
-A given habitat in nature has enough resources to support a maximum possible number beyond which further growth is not possible/ resources become limiting factor

1+1

5