Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2025
SUBJECT NAME BIOLOGY (SUBJECT CODE 044) (PAPER CODE 57/2/2)

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 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.

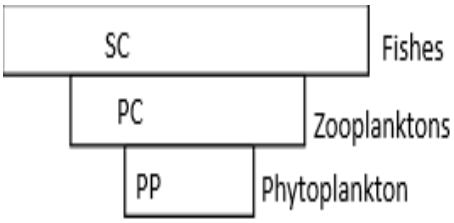
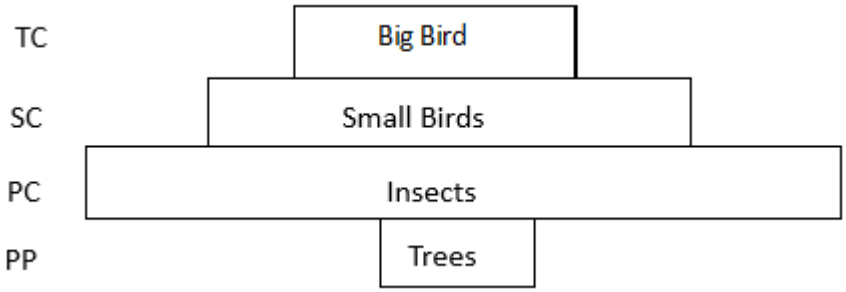
11	A full scale of marks 0-70 has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
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 totalling 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 totalling on the title page. ● Wrong totalling 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 un assessed portion, non-carrying over of marks to the title page, or totalling 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 totalled 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.

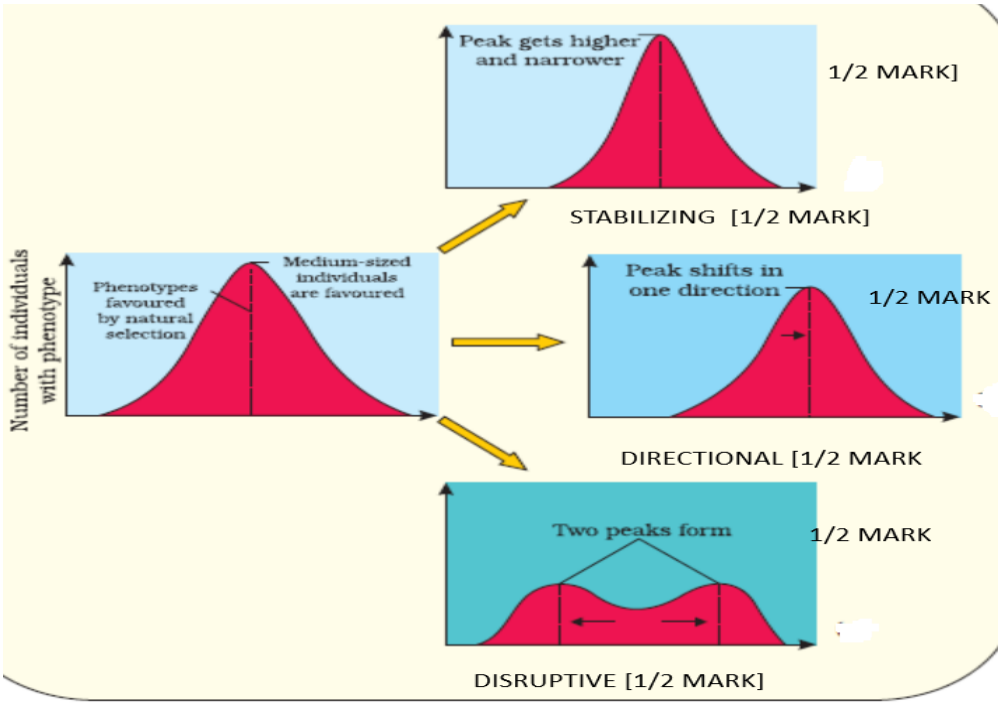
MARKING SCHEME
Senior Secondary School Examination, 2025
BIOLOGY (Subject Code–044)
[Paper Code: 57/2/2]

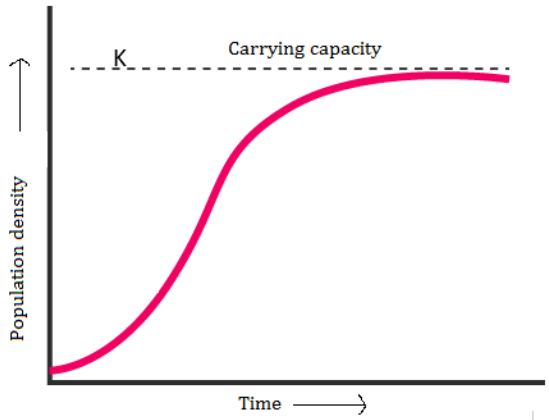
Maximum Marks:70

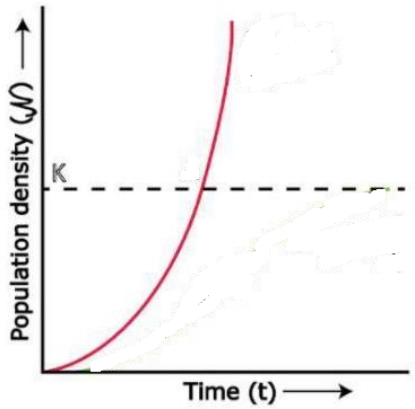
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1	(B) / 22	1	1
2	(B) / I-Pericarp, II-Endosperm, III-Coleorhiza	1	1
3	(D) / 7,8	1	1
4	(B) / 0 : 1 : 3	1	1
5	(C) / Father-I^Bi, Mother-I^AI^B, Child- I^Ai	1	1
6	(B) / (iii), (i), (ii), (iv)	1	1
7	(D) / (a)-(i), (b)-(iii), (c)-(ii)	1	1
8	(C) / mating between relatives (consanguineous mating)	1	1
9	(C) / Naturally acquired passive immunity	1	1
10	(B) / 8	1	1
11	(A) / The smaller the fragment size, the farther it moves.	1	1
12	(B) / *Monoascus purpureus*	1	1
13	(C) / (A) is true, but (R) is false.	1	1
14	(C) / (A) is true, but (R) is false.	1	1
15	(A) / Both (A) and (R) are true, and (R) is the correct explanation of (A).	1	1
16	(A) / Both (A) and (R) are true, and (R) is the correct explanation of (A).	1	1
	SECTION B		
17	(A) (i) P- Estrogen, Q- Progesterone (ii) P- Growing follicles, Q- Corpus luteum **OR** (B) (i) P- Lutenizing hormone(LH) , Q- Follicle stimulating hormone (FSH)	 ½ +½ ½ +½ ½ +½	

	(ii) • In male- Acts at the Leydig cells and stimulate the synthesis and secretion of androgen • In Female- Causes ovulation/ rupturing of graffian follicle/	½ ½	2
18	(a) HBA1 , HBA2 (b) Thalassemia is a quantitative problem of synthesising too few globin molecules, while Sickle cell anaemia is a qualitative problem of synthesising an incorrectly functioning globin molecule	½+½ ½+½	2
19	(A) -In case of snakebite, quick response is required as natural production of antibodies will take more time therefore preformed antibodies against the snake venom are injected. -In tetanus, preformed antibodies are directly injected because quick immune response is required against deadly microbes. **(or any other relevant example)** **OR** (B) The symptoms do not appear immediately as parasite initially multiply within the liver cells, and then attack RBCs, resulting in their rupture and, release toxic substance haemozoin.	½+½ ½+½ ½ x4	2
20	(a) EcoRI (b) 5′ CAG 3’ / 3′ GTCTTAA 5′ ; 5′ AATTCTTA 3′ / 3′ GAAT 5′ **(Any relevant representation)** (c) Ends are called as sticky ends because they form hydrogen bonds with their complementary cut counterparts.	½ ½+½ ½	2

21	(A)  • Inverted pyramid of biomass • The Biomass of fishes is much more than that of zooplankton and phytoplankton so the pyramid is inverted. **OR** (B)  **(1½ mark for the correct diagram, ½ mark for correct tropic level)**	1 ½ ½ 2	2
	SECTION – C		
22.	(a) 3200 male gametophyte (b) -Intine made up of cellulose, and pectin. -Exine made up of sporopollenin.	1 ½+½ 1	3
23	**(a)** (i) ZIFT – Zygote Intra Fallopian Transfer (ii) ICSI – Intra Cytoplasmic Sperm Injection (iii) IUT – Intra Uterine Insemination (iv) GIFT – Gamete Intra Fallopian Transfer **(b)** It is used to determine the sex of the baby , and it may leads to female foeticide.	½ x4 ½ + ½	3

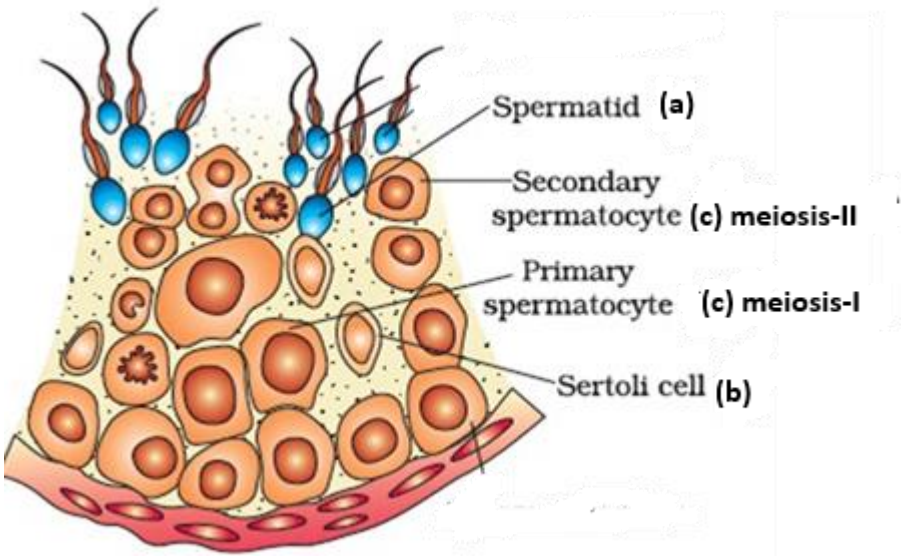
24	Cross - 1 GG × Gg [½+½] Homozygous dominant female — Heterozygous male Gamete G G — G g [½] F1 G | G | g G | GG | Gg [1] G | GG | Gg All dominant progenies are [½] produced // Cross - 2 gg × Gg [½+½] Homozygous recessive female — Heterozygous male g g — G g [½] F1 g | G | g g | Gg | gg [1] g | Gg | gg 50% dominant & 50% recessive [½] Progenies are produced	½+½ ½ 1 ½ ½+½ ½ 1 ½	3
25	 **(Correct diagram with labelling or correct explanation with diagram to be considered)**	½ ×6	3

26	(a) Sportspersons abuse certain drugs to increase their muscle strength and bulk and aggressiveness for better performance in sports. (b) Cocaine/coca alkaloids , cannabinoids , any other correct example **(any two)** (c) *Erythroxylum* , *Cannabis* ,any other correct example **(any two)**	1 ½+½ ½+½	3
27	(a) Insulin synthesized in our body as Prohormone (proinsulin) which contain extra stretch of C-peptide apart from A and B peptide, Eli Lilly company synthesized insulin in functional form with only two peptide A and B. (b) Insulin from animal sources caused some allergy or other type of immune reactions to the foreign protein / Insulin can be easily obtained in large quantity from bacteria	1+1 1	3
28	(a)  (b) • Verhulst-Pearl logistic growth/ Logistic growth curve • Since resource for growth for most animal populations are finite and become limiting sooner or later.	1 ½ ½	

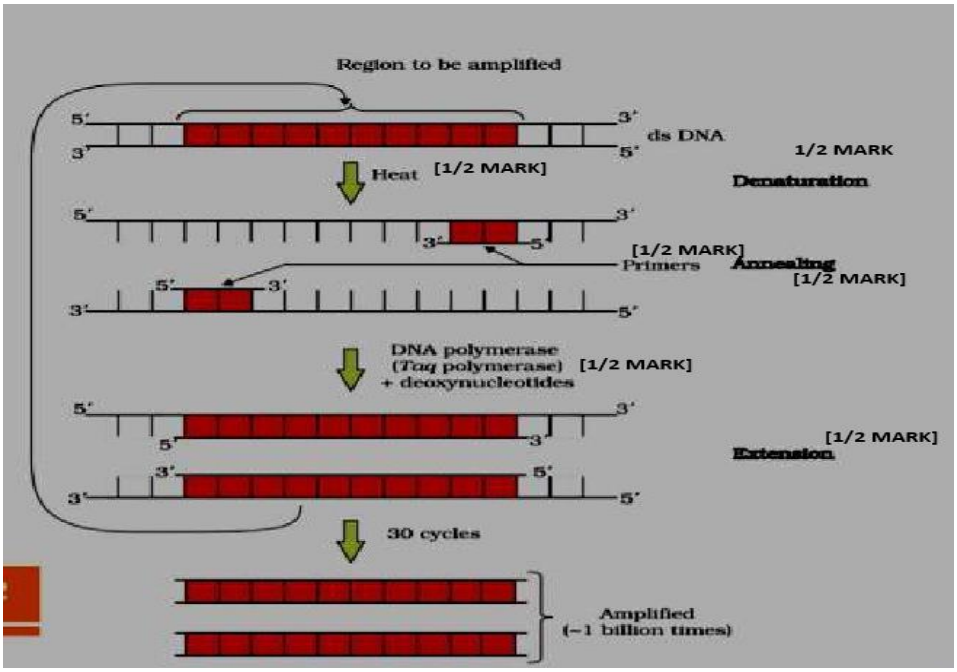
	(c)  Equation : $\frac{dN}{dt} = rN$ / $\frac{dN}{dt}=(b-d)N$ / $N_t=N_0e^{rt}$	½ ½	3
	SECTION-D		
29	(a) B-lymphocytes ,and T-lymphocytes. (b) Because the antibodies are found in the blood hence antibody-mediated immunity is also called humoral immune response. (c) (i) Our immune system is able to distinguish between 'self' and 'non-self' cells/molecules. (ii) Cell-mediated immune response , T-lymphocytes are involved. **OR** (d)	½ +½ 1 1 ½ +½	4

Active immunity	Passive immunity
When antibodies are produced by B-cells within the body	Preformed antibodies are injected into the body for defence.
It is comparatively slow	It provides quick response

30	(a) DNA -dependent RNA polymerase (b) B-coding strand, A-Template strand	1 ½+½	

	(c) -C is promoter, it is the sequence of DNA where the enzyme DNA dependent RNA polymerase binds for initiation of transcription. -D is the terminator, it is the sequence of DNA where the process of transcription terminated. **OR** (d) -C is located towards 5′ end (upstream) of coding strand -D is located towards 3′ end (downstream) of coding strand	½+½ ½+½ 1 1	4
	SECTION E		
31	(A) (i)  (ii) -Secretions of male accessory glands (prostate, bulbourethral glands and seminal vesicles) constitute the seminal plasma. -Seminal plasma is rich in fructose, calcium and, certain enzymes **(any two)** -Seminal plasma along with sperms constitutes the semen.	½ × 4 1 ½ +½ 1	

	OR (B) (i) Entry of sperm into the cytoplasm of the ovum induces the completion of second meiotic division of the secondary oocyte. (ii) As the zygote moves through the fallopian tube the mitotic divisions (cleavage) start , it results into 2 -16 daughter cells called blastomeres , Embryo with 8 to 16 blastomeres is called *morula* , Morula continues to divided and form *Blastocyst* which moves further into uterus, The blastomeres in the blastocyst are arranged into an outer layer *trophoblast* and an inner group of cells called the inner cell mass , the trophoblast gets attached to the endometrium, and the inner cell mass gets differentiated as the embryo. , the uterine cells divide rapidly to cover blastocyst which gets embedded in the endometrium and this is called as implantation **(If the student explain given points with the help of diagram it should be considered)**	1 ½ x8	5
32	(A) (i) A bacterial cell is made competent by treating it with a specific concentration of a divalent cation such as calcium, which increases the efficiency with which DNA enters the cell through pores in its cell wall. (ii) -Denaturation , DNA is heated to a high temperature resulting in the separation of two strands of DNA -Annealing , two primers are annealed to each of the single-stranded template DNA. -Extension , enzyme Taq polymerase extends the primers using the nucleotides provided in the reaction and the genomic DNA as template. //	1+1 ½ +½ ½ +½ ½ +½	



OR

(b)

(i) Transgenic animals : Animals that have had their DNA manipulated to possess and express an extra (foreign) gene are known as transgenic animals. — 1

(ii) Common reasons to produce transgenic animals are :

-**Normal physiology and development** , 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. — ½ +½

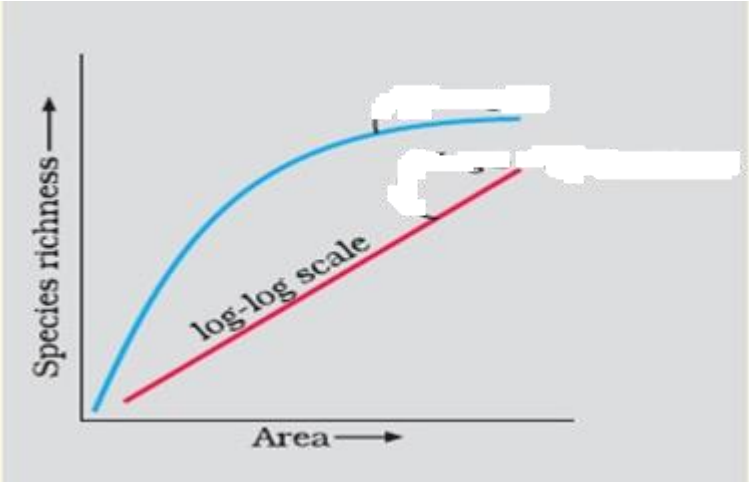
-**Study of disease** , Many transgenic animals are specially made to serve as models for human diseases so that investigation of new treatments for diseases is made possible. — ½ +½

-**Biological products** , Transgenic animals that produce useful biological products can be created — ½ +½

-**Vaccine safety** , Transgenic mice are being developed for use in testing the safety of vaccines before they are used on humans. — ½ +½

-**Chemical safety testing** , Transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals. — ½ +½

(Any Four) — 5

33	(A) (i) -Tropical latitudes have remained relatively undisturbed for millions of years and thus had a long evolutionary time for species diversification -Tropical environments are less seasonal more constant and predictable. Such constant environments promote niche specialisation and lead to a greater species diversity -More solar energy is available in the tropics which contributes to higher productivity which leads to greater species diversity. (ii)  -Alexander von Humboldt -Within a region species richness increased with increasing explored area but only up to a limit. **OR** (B) (i) -**Habitat loss and fragmentation**, Deforestation leads to habitat loss and ultimately causing extinction of animals and plants / When large habitats are broken into small fragments that also leads to population decline / mammals and birds with large territories and certain animals with migratory habits are badly affected. - **Overexploitation**, overexploitation of natural resources by humans leads to extinction of many species / For example overexploitation of Steller's sea cow or passenger pigeon or many marine fishes led to their extinction.	1 1 1 1 ½ ½ ½ +½ ½ +½	

	-**Alien species invasions**, When alien species are introduced unintentionally or deliberately for whatever purpose some of them turn invasive and cause decline or extinction of indigenous species/ For example *Parthenium* or *Lantana* or water hyacinth pose threat to indigenous species (or any other correct example)	½ +½	
	-Co-extinctions, When a species becomes extinct the plant and animal species associated with it in an obligatory way also became extinct/ For example unique assemblage of parasites and plant pollinator mutualism where extinction of one invariably leads to the extinction of the other **(any three points)**	½ +½	
	(ii) -Ex-situ conservation : In this threatened animals and plants are taken out from their natural habitat and placed in special setting where they can be protected and given special care. -e.g. : Zoological parks, Botanical gardens, Wildlife safari parks, seed banks**,** pollen bank **(any two or any other relevant examples)**	1 ½ +½	5