Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2025
SUBJECT NAME BIOLOGY (SUBJECT CODE 044) (PAPER CODE 57/5/3)

General Instructions: -

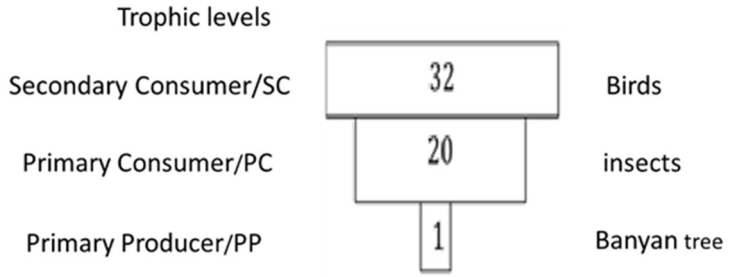
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested 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 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-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, 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".

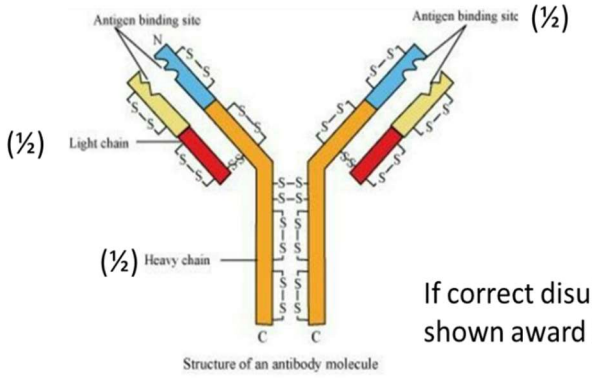
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks 0-70 has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 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.

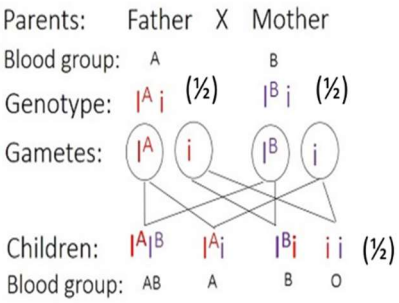
MARKING SCHEME
Senior Secondary School Examination, 2025
BIOLOGY (Subject Code–044)
[Paper Code: 57/5/3]

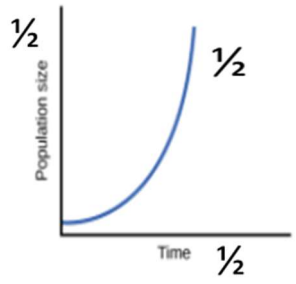
Maximum Marks: 70

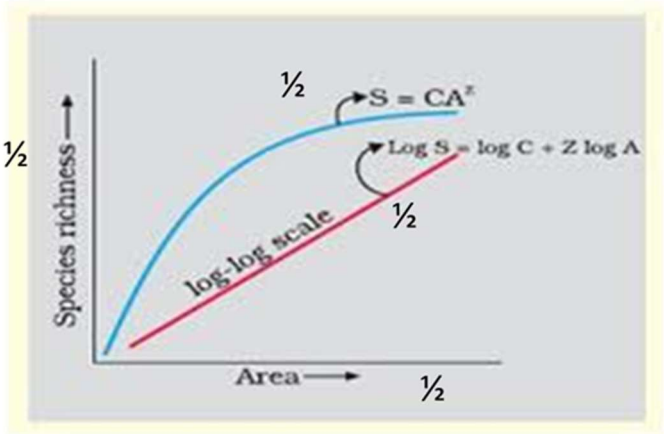
Q.NO.	EXPECTED ANSWER/ VALUE POINTS	Marks	Total Marks
	SECTION A		
1.	(D) / Promoter	**1**	**1**
2.	Award 1 mark if the child has attempted any one option.	**1**	**1**
3.	(C) / ESTs	**1**	**1**
4.	(C) / Autosomal dominant trait	**1**	**1**
5.	(C) / Spleen	**1**	**1**
6.	(D) / (i) and (iv)	**1**	**1**
7.	(C) / Spotted cuscus – Lemur	**1**	**1**
8.	(A) / AGGUAUCGCAU	**1**	**1**
9.	(A) / tRNA	**1**	**1**
10.	(B) / *Streptococcus*	**1**	**1**
11.	(C) / Cellulase	**1**	**1**
12.	(A) / 1 : 1	**1**	**1**
13.	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	**1**	**1**
14.	(C) / Assertion (A) is true, but Reason (R) is false.	**1**	**1**
15.	(D) / Assertion (A) is false, but Reason (R) is true.	**1**	**1**
16.	(C) / Assertion (A) is true, but Reason (R) is false.	**1**	**1**
	SECTION B		
17.	(a) - Diagram (ii) is the correct replicating fork - The DNA – dependent DNA polymerase catalyse polymerisation only in one direction, that is 5'→3' - On one template strand with polarity 3'→ 5' DNA synthesis is continuous and on other template strand with polarity 5'→3' DNA replication is discontinuous. (b) DNA ligase	½ ½ ½ ½	**2**

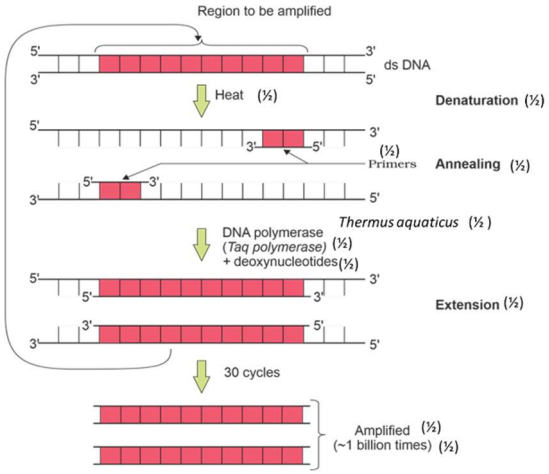
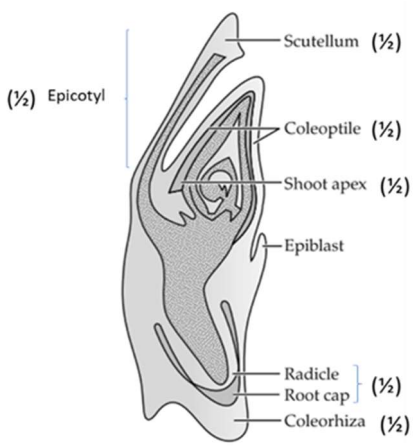
18.	(a) *Taq* polymerase (b) It forms overhanging stretches called sticky ends, which facilitates hydrogen bond formation with their complementary cut parts by DNA ligase. (c) *Escherichia coli*/*E.coli*	½ ½+½ ½	**2**
19.	(a) Fig species can be pollinated only by its 'partner' wasp species and no other species, the female wasp uses the fruit not only as an oviposition (egg-laying) site, but also uses the developing seeds within the fruit for nourishing the larvae, the wasp pollinates the fig inflorescence while searching for suitable egg-laying site. **OR** (b) Ecological pyramid of number.  1 mark for correct Trophic levels 1 mark for correct diagram of Inverted pyramid of number	½ x4 1+1	**2**
20.	(a) • Amniocentesis *:* Some of the amniotic fluid of the developing foetus is taken to analyse the fetal cells and dissolved substances. • Misuse *:* Sex-determination of foetus which lead to increase in female foeticide **OR** (b) • Gonorrhoea, chlamydiasis, genital warts, trichomoniasis, syphilis, genital herpes, hepatitis-B, AIDS **(Any two diseases)** Pelvic inflammatory diseases (PID), abortions, still births, ectopic pregnancies, infertility or even cancer of the reproductive tract **(Any two complications)**	1 1 ½+½ ½+½	**2**
21.	(a)-Each antibody molecule has four peptide chains/an antibody molecule is represented as H_2L_2 -Two small chains called light chains -two longer chains called heavy chains -It has an antigen binding site at N end (amino end) - It has disulphide bond between different parts of proteins or proteins of different chains **(Any four points)** //	½ x4	

	 Structure of an antibody molecule If correct disulphide bond is shown award ½ mark **OR** (b) - Ensuring availability of HIV free blood in blood banks - Ensuring the use of only disposable needles and syringes in public and private hospitals and clinics - Free distribution of condoms. - Controlling drug abuse. - Advocating safe sex. - Promoting regular check-ups for HIV in susceptible populations. - Preventing infection during blood transfusions in patients. - Monitoring of pregnant women for HIV **(Any four Measures)**	**½ x4** **½ x4**	**2**
	SECTION C		
22.	(a) The given type of pollination prevents inbreeding depression/ prevents loss of fertility/promote hybrid vigour/ improve genetic variability (b) - The plant will not show geitonogamy - because in this flowering plant pollen release and stigma receptivity are not synchronised/as the flowers are present on different plants.	**1** **1** **1**	**3**
23.	- Made crops more tolerant to abiotic stresses (cold, drought, salt, heat). - reduced reliance on chemical pesticides (pest resistant crops). - helped to reduce post-harvest losses. - increased efficiency of mineral usage by plants (this prevents early exhaustion of fertility of soil). - enhanced nutritional value of food (eg. golden rice i.e. vitamin 'A' enriched rice). - tailor-made plants to supply alternative resources to industries in the form of starches, fuels and pharmaceuticals. **(Any three advantages)**	**1x3**	**3**
24.	The signals of parturition originate from the fully developed fetus and the placenta, which induce mild uterine contractions called fetal ejection reflex, this triggers release of oxytocin from the maternal pituitary, Oxytocin acts on the uterine muscles and causes stronger uterine		

	contractions, which in turn stimulates further secretion of oxytocin, the stimulatory reflex between the uterine contraction and oxytocin secretion continues resulting in stronger and stronger contractions which leads to expulsion of the baby out of the uterus through the birth canal.	½ x6	3
25.	- Turner's syndrome - Such females are sterile, ovaries are rudimentary, lack of secondary sexual characters, short-statured, underdeveloped feminine character **(Any two symptoms)**	1 1 x2	3
26.	• The Amazon rain forest is being cut and cleared for cultivating soya beans or for conversion of grasslands for raising beef cattle which threaten survival of many species. • When large habitats are broken up into small fragments mammals and birds requiring large territories, and certain animals with migratory habits are badly affected leading to their extinction or population decline.	1 1+1	3
27.	(a) BOD – Biochemical Oxygen Demand (b) • The amount of the oxygen that would be consumed if all the organic matter in 1 litre of water were oxidised by bacteria. • The greater the BOD of waste water more is its polluting potential	1 1 1	3
28.	(a) Three alleles (b) Co-dominance. (c) Yes, they can have a child with 'O' blood group  	½ ½ ½ 1½	3
	SECTION D		
29.	(a) (iii) Greater, Greater (b) (i) Divergent evolution (ii) Divergent evolution - both indicates common ancestry as in both cases cytochrome C is the respiratory pigment.	1 ½ ½ 1	

	(c) (i) Convergent evolution: Different structures evolving for the same function and hence having similarity. **OR** (c) (ii) Divergent evolution: Same structure developed along different directions due to adaptations to different needs.	**1** **1**	**4**
30.	(a) 15 – 16 years or Adolescence period (12-18 years of age) (b) Clearing of forest / deforestation / Narco-deforestation / extinction of species / promotes monoculture that will further lead to loss of (c) (i) • Inflorescence / flower tops / leaves / resin. • Affects the cardiovascular system of the body/any other correct effect **OR** (c) (ii) - Erythroxylum coca - Causes hallucinations.	**1** **1** **1** **1** **1** **1**	**4**
	SECTION E		
31.	(a) (i) When resources in the habitat are unlimited each species has the ability to realize fully its innate potential to grow in number, the population grow in an exponential or geometric fashion, It results in a J-shaped curve when we plot population density in relation to time. (ii) $dN/dt = (b - d)\, rN$ / $dN/dt = rN$ / $Nt = N_0e^{rt}$ r = intrinsic rate of natural increase N = size of the population b = birth rate d = death rate (iii) Exponential growth curve  	**½ x3** **½** **½** **1** **1½**	

	OR (b) (i)- Within a region species richness increases with increasing explored area, but only up to a limit (ii) $\log S = \log C + 2 \log A$ / $S = CA^Z$ (iii)  	**1+1** **1** **½ x4**	**5**
32.	(a) Using Agrobacterium vectors nematode–specific genes were introduced into the host plants, the introduction of DNA was such that it produced both sense and anti-sense RNA in the host cells, these two RNA's being complementary to each other formed a double stranded (dsRNA), that initiated RNAi and thus silenced the specific mRNA of the nematode, consequently the parasite could not survive in a transgenics host expressing specific interfering RNA **OR** (b) - Denaturation : strands of dsDNA are separated by heating - Annealing: Multiple copies of the gene (or DNA) of interest is synthesised 'in vitro' using two sets of primers - Extension : the enzyme thermostable DNA polymerase/*Taq* polymerase, isolated from a bacterium *Thermus aquaticus*, extends the primers using the deoxyribonucleotides provided in the reaction and the genomic DNA as a the template - Amplification : replication of DNA is repeated many times to form more than a billion copies of a fragment of DNA //	**1x5** **½+½** **½+½** **½ x4** **½+½**	

		½ x10	5
33.	(a) (i) Embryo of a monocotyledon seed has one cotyledon called scutellum, situated towards one side (lateral) of the embryonal axis at its lower end, the embryonal axis has the radical and root cap, enclosed in an undifferentiated sheath coleorhiza, The portion of the embryonal axis above the level of attachment of scutellum is epicotyl, and a few leaf primordia enclosed in a hollow foliar structure the coleoptile /  (Marks to be allotted if the key points are depicted in the diagram in lieu of explanation.) (ii) • Some of the Nucellar cells surrounding the embryo sac start dividing, and protrude into the embryo sac and develop into embryos. • Apomixis/Polyembryony **OR** (b) (i) - Rete testis, The seminiferous tubules of the testis open into the Vasa efferentia through rete testis - Vasa efferentia, leave the testis and open into epididymis located along the posterior surface of each testis	½ x6 ½ x6 1 1 ½+½ ½+½	

	- Epididymis, the epididymis leads to Vas deferens - Vas deferens, this ascends to the abdomen and loops over the urinary bladder. (ii) FSH acts on Sertoli cells, stimulates secretion of some factors which help in the process of spermiogenesis (which is a part of spermatogenesis).	½+½ ½+½ ½+½	5