Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2025
SUBJECT NAME - BIOLOGY (SUBJECT CODE 044) (PAPER CODE 57/6/3)

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-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, 2023

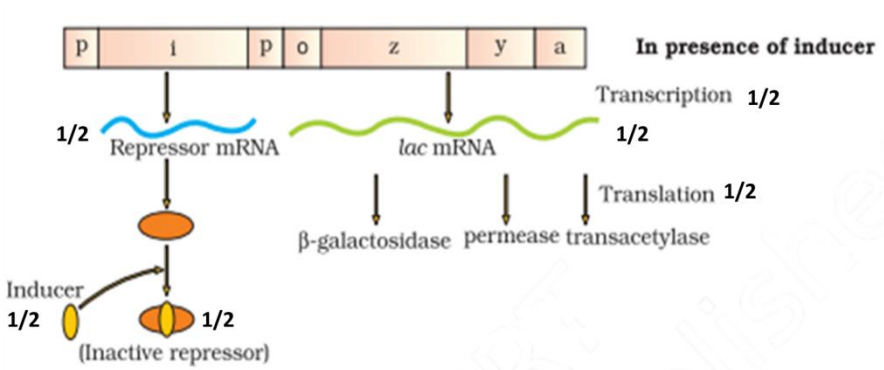
BIOLOGY (Subject Code–044)

Paper Code: 57/6/3

Maximum Marks: 70

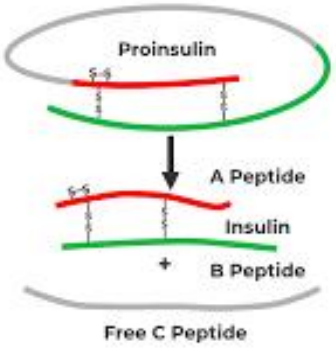
Q.N.	Expected answer/value points	Mark	Total marks
	SECTION A		
1.	(A)/ Polypeptide only	1	1
2.	(B) /Autosomal recessive	1	1
3.	(C) /0·32	1	1
4.	(C) /(iii) and (iv)	1	1
5.	(C) /(ii), (iv) and (v)	1	1
6.	(C) /One X-chromosome of mother	1	1
7.	(B) /UAAGCUAC	1	1
8.	(D) /5’ end (before start codon) and 3’ end (after stop codon).	1	1
9.	(B) /MALT	1	1
10.	(A) /Ichthyosaurus	1	1
11.	(A) /Nucleopolyhedrovirus	1	1
12.	(C) /Pst I	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.	(A) /Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	1	1
15.	(C) /Assertion (A) is true, but Reason (R) is false.	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) • To check indiscriminate and illegal female foeticide • First trimester/ 12 weeks/ First three Three month **OR**	1+1	

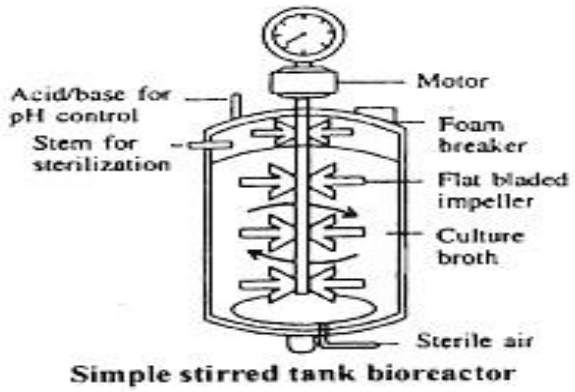
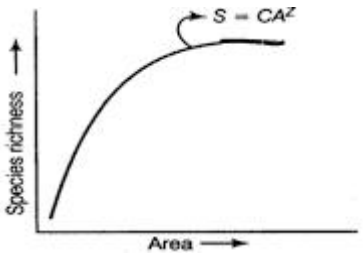
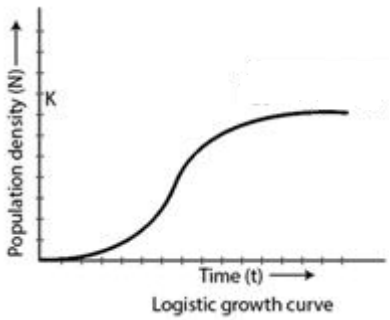
	(b) • Pelvic Inflammatory disease • Human immunodeficiency Virus /HIV, Genital herpes, Hepatitis B **(Any two)**	1 ½ + ½	2
18	(a) (i) Provides antibodies/provides IgA/ provide nutrition/ Provides passive immunity (ii) Colostrum **OR** (b) (i) Allergy (ii) (ii) IgE (iii) Histamine and Serotonin	 1 1 ½ ½ ½+½	 2
19	(a)One petal of *Ophrys* bear uncanny resemblance to the female of the bee in size colour and marking, male bee pseudo-copulates with the flower considering it as a female and during the process is dusted with pollen from the flower **OR** (b) Fragmentation, leaching, Catabolism, humification, Mineralisation **(1 Mark for correct sequence)** **Humification**: It leads to accumulation of a dark coloured amorphous substance which is called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate.	1+1 1 1	 2
20	(a) Gene cloning /Amplification (b) (i) EcoR I to cut both the plasmid and alien DNA (ii)Cutting with Same restriction enzyme will yield sticky ends at the end of both DNA which can be joined together by DNA ligase	½ ½ 1	 2
21	(a) six (b) ● 10 ● 0.34nm/3.4 A^{o} (c) The plane of one base pair stack over the other in double helix additionally confirms stability of helical structure of DNA	½ ½ ½ ½	 2
	SECTION-C		
22	(a) Sedimented bacterial flocs in settling tank is called activated sludge (b) In anaerobic bacteria digest the bacteria and the fungi in the sludge, during this	1	

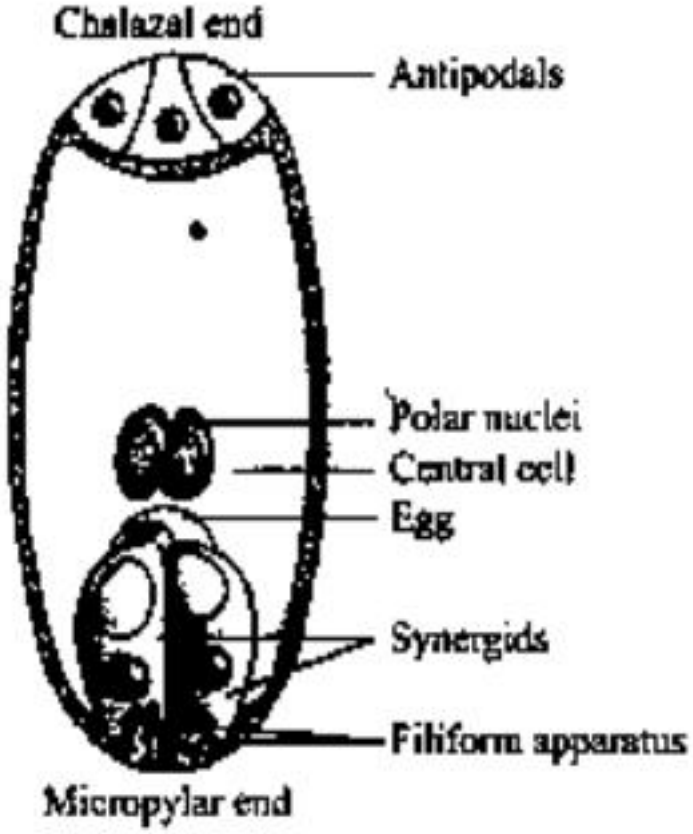
	digestion bacteria produce a mixture of gases (such as methane, hydrogen sulphide and carbon dioxide)	1+1	3
23	(a)Produces human protein enriched milk (2.4 gm/litre), the human alpha lactalbumin is more nutritionally balanced for human babies (b) To treat emphysema	1+1 1	3
24	(a) Female bee- Meiosis Male Bee- Mitosis (b) Haplo diploid Sex determination system (c) Male , 16	½+½ 1 ½+½	3
25	(a)The Nile perch introduced into Lake Victoria in East Africa led eventually to the extinction of an ecologically unique assemblage of more than 200 species of *Cichlid* fish in the lake**,** the environmental damage caused and threat posed to our native species by invasive weed species like carrot grass *(Parthenium*) or Lantana or water hyacinth *(Eicchornia)***,**Introduction of the African catfish *Clarias gariepinus* for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers **(Any two)** (b) High degree of endemism and high level of species richness	1+1 ½ + ½	3
26	Lactose transported into the cell through permease, in the presence of an inducer lactose the repressor is inactivated by interaction with the inducer, this allows RNA polymerase access to the promoter and transcription proceeds //  	1x3 ½ x6	3
27	(a) -Inner wall: Endometrium, endometrium undergoes cyclical changes during menstrual cycle/ thickening of endometrium is required for pregnancy - Middle layer: Myometrium, myometrium exhibits strong contraction during delivery of the baby (b) The edges of the infundibulum in ovary possess finger-like projections called fimbriae, which help in collection of the ovum after ovulation.	½ x4 ½x2	3
28	(a) Self incompatibility, It is a Genetic mechanism to prevent self-pollen (from the		

	same flower or other flower of same plant) from fertilising the ovules by inhibiting pollen germination or pollen tube in the pistil/ non-synchronisation of pollen release and stigma receptivity, Either the pollen is released before the stigma becomes receptive or stigma becomes receptive much before the release of pollen (b) It would have led to inbreeding depression	1+1 1	3
	Section -D		
29	(a) Mutation (b) A/ Greater the evolutionary distance, greater are the differences in the nitrogenous bases/ or D/ Lesser the evolutionary distance, Lesser are the differences in the nitrogenous bases (c) (i) Divergent Evolution, As both of them diverge from same ancestor and possess homologous structure. **OR** (c) (ii) **(Any two correct difference)**	1 1 1+1 1+1	4
30	(a) Number of men taking treatment was higher than women/1 woman out of 18 was treated/1 man out of 7 was treated/ 1 in 11 persons was addicted *to Cannabis sativa or Papaver somniferum* /drug user have increased by 20% / 292 million people were consuming drugs in 2022 ***(*any two observations)** (b) Contaminated needles sharing between drug addicts transmits diseases like Hepatitis B and HIV. Both diseases are primarily caused by viruses. (c) *(i)Cannabis sativa* **OR** (c) *(ii)Papaver somniferum*	½ + ½ 1+1 1 1	4

Divergent Evolution	**Convergent Evolution**
They have different ancestry	They have common ancestry
They possess homologous structures	They possess analogous structures
Anatomically same organ but perform different function	Anatomically different Organ but performs same function.

	Section - E		
31	(a) (i) Pro- insulin is processed by removal of c-peptide which is removed during maturation into insulin. //  (ii) Two DNA sequences corresponding to A and B chains of human insulin, are introduced in plasmids of *E.coli* to produce insulin chains, A & B chain are produced separately , extracted and combined by creating disulphide bonds to form human insulin. **OR** (b) (i) -A simple stirred-tank reactor is cylindrical or with a curved base to facilitate the mixing of the reactor contents -The stirrer facilitates even mixing and oxygen availability throughout the bioreactor, -Air can be bubbled through the reactor, -It has an agitator system , - a foam control system , -a temperature control system, -pH control system , **(any six point)** //	1 1 1x4 ½ x6	

	 **Simple stirred tank bioreactor** **(Diagram with any six labeling)** (ii) The processes include separation, and purification which are collectively referred to as downstream processing.	½x6 2	5
32	(a) He observed that within a region species richness (the number of different species) increase with increasing area, only up to a limit (ii) ●  **(1/2 mark each for both axis and 1 mark for correct graph)** • Z shows relationship between species richness and area/ Regression coefficient/ slope of graph **OR** (b) (i) A population growing in a habitat with limited resources show initially a lag phase, followed by phases of acceleration, and deceleration and finally an asymptote, when the population density reaches the carrying capacity  Logistic growth curve	1+1 1+1 1 1/2x4 1	

	(ii) **DN/dt = rN(K-N/K)** Where N = Population density at time t r = Intrinsic rate of natural increase K = Carrying capacity/ maximum possible numbers in a given habitat	1 ½ ½	5
33	(a) (i) Three cells are grouped together at the micropylar end of embryo sac, constitute the egg apparatus, the egg apparatus in turn consists of two synergids , one egg cell, the synergids have special cellular thickenings at the micropylar tip called filiform apparatus, three cells are at the chalazal end and are called the antipodals, the large central cell has two polar nuclei, thus a typical angiosperm embryo sac at maturity though 8-nucleate is 7-celled //  (**Award marks for correct diagram with 8 labeling)** (iii) One of the two male gametes fuses with the two polar nuclei located in the central cell to produce a triploid primary endosperm nucleus (PEN).	½x 8 ½x 8 1	

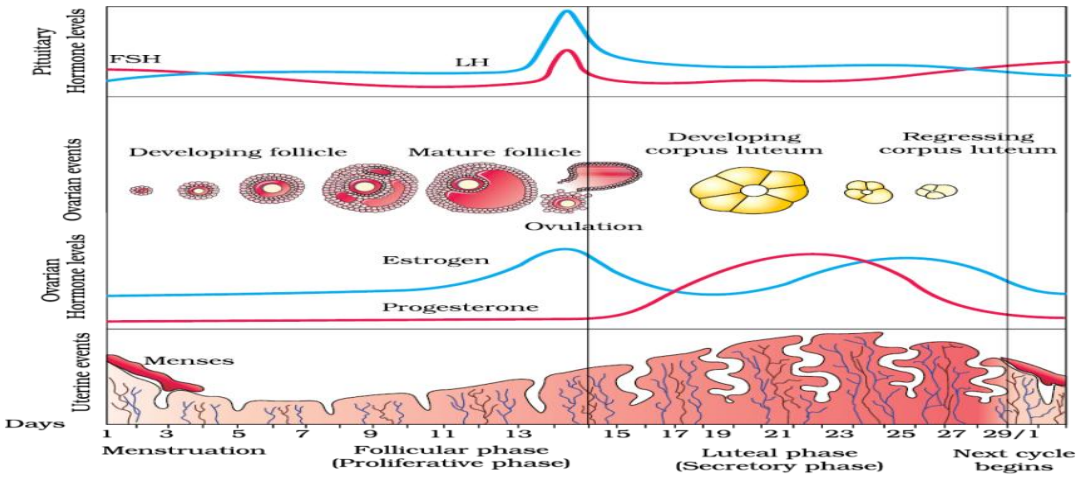
Or

(b)

Phases of Menstrual cycle	Pituitary hormones	Ovarian hormone	Ovary	Uterus
1) Menstrual phase/day 1-5	Low FSH and LH	Low Progesterone and Estrogen	Follicle start to develop	Lining of endometrium shed and expelled as menstrual flow
2)Follicular/Proliferative phase/day 6-13	FSH and LH rises	Estrogen rises and low progesterone	Follicle mature	Endometrium to thicken
3) Ovulatory phase/day 14-15	LH surge (about 14th day)	Increase level of estrogen and low progesterone	Graafian follicle ruptures	Uterus lining further thickens
4) Luteal phase/day 16-28	FSH and LH level begins to decline	High progesterone and low Estrogen	Ruptured follicle transformed into the corpus luteum which produce progesterone and estrogen	Uterus lining continues to thicken for implantation

1 + ½x4 + ½x4

(NOTE: If all phases of menstrual cycle are correct then award 1 mark, Award ½ marks if both ovarian and pituitary hormone levels are correct in each phase and ½ marks for changes in both ovary and uterus for each phase)

	//  **(NOTE: If all phases of menstrual cycle are correct then award 1 mark, Award ½ marks if both ovarian and pituitary hormone levels are correct in each phase and ½ marks for changes in both ovary and uterus for each phase)**	1 + ½x4 + ½x4	5