Marking Scheme

Strictly Confidential

(For Internal and Restricted use only)

Senior School Certificate Examination, 2023

SUBJECT NAME BIOLOGY (FOR VISUALLY IMPAIRED CANDIDATES ONLY)
(SUBJECT CODE 044) (PAPER CODE 57(B))

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 _____(example 0 to 80/70/60/50/40/30 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).
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 un assessed 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, 2023
Biology (Subject Code–044)
[Paper Code: 57B]

Maximum Marks: 70

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(b) / That makes the cervix hostile to sperms.	1	1
2.	(b) / P – iii, Q – iv, R – ii, S - i	1	1
3.	(a) / Sugar – Phosphate.	1	1
4.	(c) / The moths that were able to camouflage their colour with the background, survived.	1	1
5.	(d) / Pneumonia – Airborne.	1	1
6.	(b) / It is not characterised by memory.	1	1
7.	(b) / Yeast – Commercial preparation of ethanol.	1	1
8.	(a) / Microinjection – Animal cell. // (d) / 'Disarmed pathogen' vectors – plants.	 1	 1
9.	(d) / Mutualism.	1	1
10.	(d) / To avoid detection by predators.	1	1
11.	(d) / 10 J	1	1
12.	(b) / Angiosperms.	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 (R) is the correct explanation of the Assertion (A).	1	1
15.	(b) / Both Assertion (A) and Reason (R) are true and reason (R) is ***not*** the correct explanation of the Assertion (A).	1	1
16.	(b) / Both Assertion (A) and Reason (R) are true and reason (R) is ***not*** the correct explanation of the Assertion (A).	1	1
	SECTION -B		
17.	(a) Opening of uterus into vagina through cervix / a cavity of cervix. (b) It forms birth canal along with vagina/ during the birth of child.	1 1	2
18.	(a) Sutton and Boveri / Sutton.	1	

<table>
<tr><td></td><td>(b) Both occur in pairs, both segregate at the time of gamete formation, both show independent segregation.
(Any Two)</td><td>½ x 2</td><td>2</td></tr>
<tr><td>19.</td><td>(a) Water / Hydrophily
(b) Mostly Monocotyledons/ submerged and partially submerged aquatic plants
(c) Water hyacinth, Water lily, any other correct example
(Any two)</td><td>½
½
½ x 2</td><td>2</td></tr>
<tr><td>20.</td><td>It in encodes for protein that provides antibiotic resistance / it encodes for β galactosidase that gives blue colour E.coli colonies in the presence of chromogenic substrate, normal cell do not have this trait.</td><td>1 x 2</td><td>2</td></tr>
<tr><td></td><td>SECTION B</td><td></td><td></td></tr>
<tr><td>21.</td><td>(a) (i) Natality/birth rate/number of births, Immigration
(ii) Mortality/death rate/number of deaths, Emigration
OR
(b) (i)
<table><tr><td>J-Shaped growth curve</td><td>S-Shaped growth curve</td></tr><tr><td>•Unlimited resources</td><td>•Limited resources</td></tr><tr><td>•No competition</td><td>•Competition occurs</td></tr><tr><td>•Population grows in exponential or geometric fashion</td><td>•Population growth is sigmoid in pattern.</td></tr><tr><td>•Uncontrolled growth in absence of checks.</td><td>•Controlled growth due to checks.</td></tr><tr><td>•It is not realistic</td><td>•It is realistic.</td></tr><tr><td>•Stationary phase is not achieved.</td><td>•Stationary phase is achieved.</td></tr></table>(Any one difference)
(ii) ‘S-Shaped’/ logistic curve is realistic, because resources are always finite and become limiting later or sooner.</td><td>½× 2
½× 2
1
½ x 2</td><td>2</td></tr>
<tr><td></td><td>SECTION C</td><td></td><td></td></tr>
<tr><td>22.</td><td>• - LH in uterus / LH Surge - Help in rupturing Graafian Follicle/ Mature follicle / ovulation,
- FSH - follicular development & estrogen secretion,
- Estrogen in ovary - Follicular development
(Any two)</td><td>½× 2</td><td></td></tr>
</table>

	(No marks to be awarded for the name of the hormone) • Corpus luteum formed, which secretes progesterone, (which is essential to maintain endometrium).	1 x 2	3
23.	• One male gamete fuses with 2 polar nuclei, to produce 3n/ triploid PEN called triple fusion, other male gamete fuses with egg cell nucleus, to form zygote (2n), called syngamy, since both type of fusions (syngamy and triple fusion) occurs so it is known as double fertilisation.	½ × 6	3
24.	• DNA dependent DNA Polymerase/ DNA Polymerase • Enzymes is fast, highly efficient, high degree of accuracy, polymerise only in 5'→ 3'direction, uses DNA template for replication, cannot initiate the process of replication on its own. **(Any two)** • Would result in mutations	1 ½ x 2 1	3
25.	• Anatomically/structurally different, but functionally same, and occurs in similar habitat. • Sweet potato is a root modification, and potato is a shoot modification, common function is storage of food. **(or any other correct example with correct explanation from plants)**	½ x 3 ½ x 3	3
26.	(a) Caused by virus, can be spread from person-to-person by sharing infected needles and syringes, both lead to chronic infections and are ultimately fatal, both can be spread by sexual contact, both can be spread by transfusion of infected blood, both are incurable, both can be transmitted from infected mother to the foetus. **(Any three)** **OR** (b) (i) • Adolescence is accompanied by several biological and behavioral changes/ changes in attitude and beliefs. • This phase is vulnerable because the individual undergoes mental and psychological development at this stage. (ii) • Dependence leads to -manifestation of withdrawal syndrome/symptoms/ anxiety -shakiness - nausea - sweating **(Any one)** • If regular dose of drugs/alcohol is abruptly discontinued.	1x3 1 1 ½ ½	3
27.	Cell treated with cellulase to break the cell wall, DNA along with other macromolecules like RNA/proteins/polysaccharides/lipids released, RNA removed by ribonuclease, proteins removed by protease, DNA precipitates out/ isolated, by addition of chilled ethanol.	½ × 6	3

28.	(a) Thorns in plants like A*cacia/Cactus*/Any other correct example. (b) Monarch butterfly is highly distasteful due to a chemical substance in its body **(or any other correct example)** (c) A cuckoo lays eggs in the nest of other species like crow **(or any other correct example)**	1 1 1	3
	SECTION D		
29.	(i) (a) To label viral DNA with radioactive phosphorus as phosphorus is a component of DNA (b) Protein capsule of virus had radioactivity/viral coat protein got radioactively labelled. (ii) Bacteriophage attaches to the bacterium *E.coli/* bacteria infected with Viruses, viruses passes its genetic material during infection and multiply. (iii) (a)They concluded that the genetic material is DNA. **OR** (iii) (b) Blender was used to separate the protein coat of bacteriophage from *E.coli.*	1 1 ½ x 2 1 1	4
30.	(i) • Filariasis – *Wuchereria bancrofti /Wuchereria malayi /* filarial worm. • Ringworm – *Microsporum/Trichophyton/Epidermophyton* (ii) •Filariasis – chronic inflammation of lymphatic vessels of the lower limbs/genital organs/leading to gross deformities. •Ringworm – appearance of dry scaly lesions on skin nail and scalp/severe itching. (iii) (a) •Filariasis – bite by female mosquito vector •Ringworm – from soil/ used towels or clothes or comb of infected individuals **OR** (iii) (b) •Filariasis - Control or eliminate vector/ control breeding places of vector / any other measure to control mosquito can be considered **(Any two)** •Ringworm – Avoid the exposure of heat and moisture as they thrive in skin folds, such as in groin or between toes/ Avoid sharing of towels or clothes or combs. **(Any other correct two preventive measures)**	½ ½ ½ ½ 1 1 ½ x 2 ½ x 2	4
	SECTION E		
31.	(a) • Helps in crop improvement programme / crossing different species or genera to combine desirable characters / to produce commercially superior varieties. • - Emasculation: Removal of the anther from the flower bud before the anther dehisces. - Bagging: Covering the emasculated flower with a bag of suitable size to prevent contamination of its stigma with unwanted pollen.	1 1 1	

	- Dusting of desired pollen on the stigma and re-bagging. **(Half mark each if only name of process Emasculation and Bagging is mentioned)** •Artificial hybridization is not required in plants with only staminate flowers/emasculation not required for unisexual flowers. **OR** (b) (i) –Head, contains an elongated haploid nucleus, carries genetic material - Acrosome, filled with enzymes, that help in fertilization - Middle piece, numerous mitochondria, which produce energy -Tail, posterior part of sperm, facilitates sperm movement. **(Any three)** (ii) about 200 – 300 million sperms	1 1 ½ × 3 ½ × 3 ½ × 3 ½	5
32.	(a) - Could be grown in very simple, synthetic medium in lab (low cost and maintenance) - Have a small reproductive span (two weeks) - A single mating can produce large number of progeny - Clear differentiation of sexes - Many types of hereditary variations **OR** (b) (i) • - Identify all the approximately 20,000 - 25,000 genes in human DNA - Determine the sequences of the 3 billion chemical base pairs that make up human DNA. - Store this information in databases. - Improve tools for data analysis. - Transfer related technologies to other sectors, such as industries. - Address the ethical / legal / social (ELSI) issues that may arise from the project. **(Any two)** (ii) • Expressed sequence Tags – identifies all genes that are expressed as RNA. • Sequence Annotation – the whole set of genome that contained all the coding and non-coding sequences and later assigning the regions with functions. **(No mark to be awarded for name of methodologies.)** (iii) • BAC/Bacterial Artificial Chromosome • YAC/Yeast Artificial Chromosome (iv) The fragment were sequenced using automated DNA sequences that worked on the principle of a method developed by Frederick Sanger.	1×5 1 x 2 ½ ½ ½ ½ 1	5

33.	(a) (i) Due to deletion of adenosine deaminase gene. (ii) Lymphocytes from blood of the patient are grown, in a culture outside the body, a functional ADA cDNA, is then introduced in these lymphocytes, using a retroviral vector, which are subsequently returned to the patient. (iii) Periodic infusion required as these cells are not immortal/ are mortal. **OR** (b) (i) Using *Agrobacterium* vectors, nematode specific genes are introduced into the host plant, introduced DNA forms both sense and antisense RNA in host cells, which are complementary so produce double stranded RNA, that initiates RNAi and thus silencing specific mRNA of the nematode, hence parasite could not survive in a transgenic host. (ii) •Roots •Yield is reduced	1 ½ × 6 1 ½ × 6 1 1	5

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