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Senior Secondary School Term II Examination, 2022

Marking Scheme – BIOLOGY (SUBJECT CODE — 044)

(PAPER CODE — 57/1/1)

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 News Paper/Website etc may invite action under 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 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, marks should be awarded.**

4. 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. 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.

5. Evaluators will mark(√) wherever answer is correct. For wrong answer 'X' be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**

6. 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 totalled up and written in the left-hand margin and encircled. This may be followed strictly.

7. 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.

8. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.

9. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

10. A full scale of marks 0-35 has to be used. Please do not hesitate to award full marks if the answer deserves it.

11. Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 30 answer books per day in main subjects and 35 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.

12. 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 a reply.
    - 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.
    - 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.

13. 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.

14. Any unassessed 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.

15. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

16. 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.

17. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

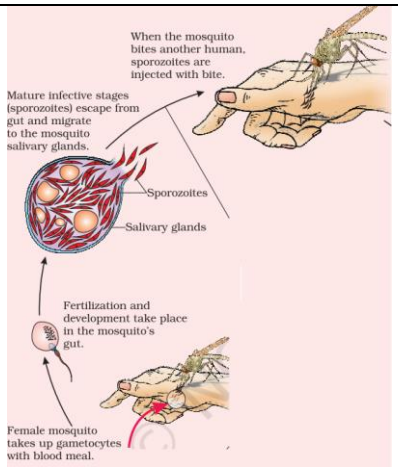
MARKING SCHEME

Senior Secondary School Examination TERM–II, 2022

BIOLOGY (Subject Code — 044)

[Paper Code — 57/1/1]

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks
	SECTION – 'A'	
1.	• Common cold–nose / respiratory passage - Pneumonia–(alveoli of) lungs / (air sacs of) lungs • causative agents–*Streptococcus pneumoniae* / *Haemophilus influenzae* (pneumonia) - Rhino virus (common cold)	½ ½ ½ ½ 2
2.	Allows vigorous growth of microbes, formation of flocs to form mesh like structures, microbes consume major part of organic waste in the sewage, reduces BOD of the affluent / reduces polluting potential **OR** *(a)* • Biogas / Gobar gas • Methane, CO_2 /H_2 / H_2S **Note: any one component along with methane to be awarded one mark.** *(b)* Anaerobic digestion of cellulose	½×4 ½ ½+½ ½ 2
3.	*(a)* Baculoviruses / *Nucleopolyhedrovirus* *(b)* Species specific, narrow spectrum insecticidal application, no negative impact on plants / mammals / birds / fish / non-target insects, desirable for integrated pest management (any two)	1 ½+½ 2
4.	Female *Anopheles* mosquito takes up gametocytes with blood meal, Fertilization and development take place in the mosquito's gut, Mature infective stage (sporozites) escape from the gut and migrate to mosquito salivary gland, Female *Anopheles* bites the humans transmitting the plasmodium to its second host to complete its life cycle. // Completes sexual stages of life cycle in female *Anopheles* mosquito / female *Anopheles* mosquito acts as primary host, acts as vector to transfer parasites from infected person to healthy person to complete its life cycle. //	½×4 1+1

		½ x 4 2
5.	*(a)* Carrying capacity is the maximum possible number of organisms (beyond which no further growth is possible) in a habitat. *(b)* Limited resources lead to competition, fittest survives and reproduces	1 ½+½ 2
6.	(a) Shark harvest increases over the years from 1992 to 2003. (b) Biodiversity decreases due to over exploitation/ excessive harvesting **OR** Tilman conducted experiments in out door plots, plots with more species shows less year to year variation in biomass (more stability).	1+1 1+1 2
	SECTION – 'B'	
7.	*(i)* Panama—Tropic Canada—Temperate Denmark—Polar *(ii)* Latitudinal gradient, species diversity decreases as we move away from equator toward poles / species diversity vary due to different climatic conditions present at different places of world.	½×3 ½+1 3
8.	(a) • Five extinctions have already occurred • sixth is in progress (b) • Sixth extinction is much faster / sixth extinction is 100 to 1000 times faster • Human activities like industrialisation, loss of habitat, over exploitation,land reforms. (Any two)	½+½ 1 ½+½ 3

9.	• *Agrobacterium tumefaciens*—(plants pathogen), The disarmed Ti Plasmid is used as a vector to introduce the gene of interest in the variety of plants. • Retrovirus—(animals), Disarmed Retroviruses are used to transfer genes of interest in to mammalian host cells.	½+1 ½+1 3
10.	Bacteria—*Rhizobium / Azospirillum / Azotobacter* Fungi—*Mycorrhiza / Glomus* Cyanobacteria—*Anabaena / Nostoc / Oscillatoria*	½+½ ½+½ ½+½ 3
11.	Do not eradicate pests but keep them at manageable level by various checks and balances, pests may be food for otherwise beneficiary predators and parasites who would suffer and not survive, more varieties in a landscape more sustainable it is (or any other correct reason)	1×3 3
12.	(i) Helps in identifying non-transformants from transformants / Recombinants from non Recombinants (ii) Genes encoding resistance to antibiotics such as ampicillin / tetracycline/ kanamycin / chloramphenicol / amp^R / tet^R (iii) (The normal E. coli cells do not carry resistance against any of these antibiotics.) It helps to identify and select transformants / identification of recombinants. **OR** • Plasmids are extra chromosomal self-replicating (double stranded) circular DNA molecules (generally found in bacterial cell) • Plasmid is circular extra chromosomal DNA of bacterial cells whereas cloning vector is a vehicle that carries foreign DNA into another cell. • Bacteriophage, pBR322	1 1 1 1 1 ½+½ 3
	SECTION – 'C'	
13.	*(i)* • Species A • The leaf area damaged by species - A in Bt-corn is the least *(ii)* Species-B *(iii)* Not to grow Bt variety as seeds are expensive and of not much benefit (productivity wise) / advise to grow Bt corn with its proper justification *(iv)* Cry IAb. (No marks if only cry gene is written) **OR**	1+1 1 1 1

(i)

- (Isolation of genetic material) Fungal cell treated with chitinase, RNA to be removed by treating with RNAase, protein removed by treating with protease, and then addition of chilled ethanol. ½ × 4
- Cutting of DNA at specific location by restriction enzymes. ½
- Fragments are separated by gel electrophoresis ½

(ii) Multiple copies of separated genes of interest is synthesized by following steps of the method given below: PCR (polymerase chain reaction) - Denaturation, Annealing, Extension (followed by amplification) ½ x 4

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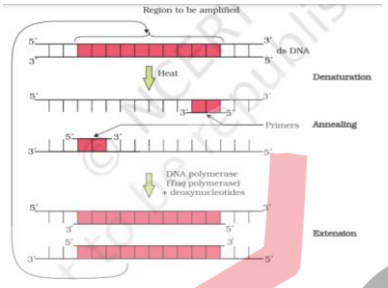
(ii)Polymerase chain reaction/PCR ½



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½

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(ii) Multiple copies of separated genes of interest are synthesized by following the given below method: rDNA technology, same restriction enzyme cutting both foreign DNA and vector DNA at specific point, ligases join foreign DNA to Plasmid, transformation (cell divides and helps in multiplication of genes) ½ x 4

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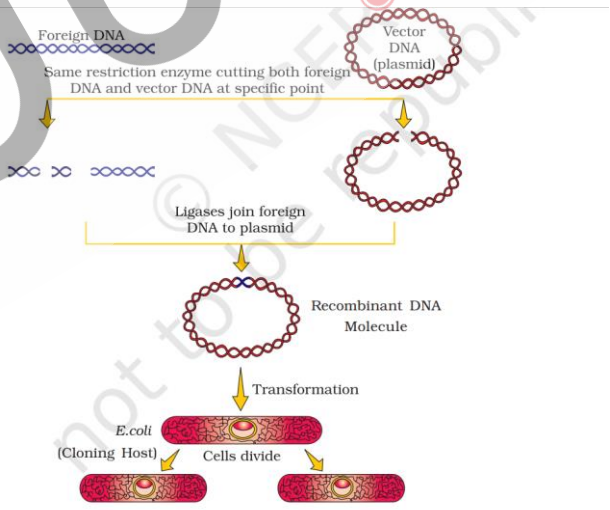
(ii) rDNA technology ½



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½

½

½

5

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