

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior Secondary School Supplementary Examination, 2024
SUBJECT NAME: BIOLOGY (SUBJECT CODE :044) (PAPER CODE:57(B)/S)

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 deliberation 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(\checkmark) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (\checkmark)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 to 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	<p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"> ● 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. ● Leaving answer or part thereof unassessed in an answer book. ● 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 Supplementary Examination, 2024
BIOLOGY (Subject Code-044)
[Paper Code: 57/(B)/S]

Maximum Marks: 70

Q.No.	EXPECTED ANSWER / VALUE POINTS	MARKS	TOTAL MARKS
Section A			
1.	(D) / bagging and rebagging	1	1
2.	(D) / Grass	1	1
3.	(B) / Hen	1	1
4.	(C) / male drone	1	1
5.	(C) / Thick-shelled eggs	1	1
6.	(C) / Neanderthal man	1	1
7.	(B) / an autosomal recessive disease	1	1
8.	(C) / codominance and multiple allelism	1	1
9.	(D) / Its size reduces with the growth of the individual.	1	1
10.	(A) / lactose	1	1
11.	(D) / mice	1	1
12.	(D) / Female mosquito	1	1
13.	(C) / Assertion (A) is true, but Reason (R) is false	1	1
14.	(B) / Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).	1	1
15.	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
16.	(D) / Assertion (A) is false, but Reason (R) is true.	1	1
SECTION B			
17.	(i) <ul style="list-style-type: none"> • Outside seminiferous tubule / interstitial spaces • Synthesise and secrete testicular hormones or androgens. (ii) <ul style="list-style-type: none"> • In seminiferous tubule (along inner lining) • Provide nutrition to germ cells. 	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	2

18.	<p>-The codon is triplet</p> <p>- 61 codons code for amino acids and 3 codons don't code for any amino acids hence they function as stop codons.</p> <p>- Some amino acids are coded by more than one codon / the genetic code is degenerate.</p> <p>-The codon is read in mRNA in a contiguous fashion / there are no punctuations.</p> <p>-The code is nearly universal.</p> <p>-AUG has dual functions / AUG codes for Methionine (met) and it also act as initiator codon.</p> <p>-UAA, UAG, UGA are stop or terminator codons.</p> <p style="text-align: center;">(Any Two)</p>	1+1	2
19.	It is on the basis of patient's weight , history of prior use.	1+1	2
20.	<p>- Stem cell technology is useful in treatment diseases like diabetes, spinal cord injury, heart disease etc.</p> <p>- Genetic disease e.g. cystic fibrosis can be treated by this.</p> <p>- Through tissue repair, different disease can be treated by this technology.</p> <p>-Adult bone marrow are injected in heart arteries to improve cardiac functions.</p> <p>-Injection of stem cells reduces pancreatic cancer.</p> <p>- Stem cells are also helpful in rheumatoid arthritis.</p> <p>-These are also used in restoration of vision.</p> <p style="text-align: center;">(Any Two)</p>	1+1	2
21.	<p>(a) Sparrow</p> <p>It is a primary consumer when it eats seeds or fruits.</p> <p>It is a secondary consumer when eats insects and worms.</p> <p style="text-align: center;">(Any other example with correct explanation)</p>	1 ½ ½	

	(b) <ul style="list-style-type: none"> • Dark coloured amorphous substance which is resistant to microbial action and undergoes decomposition at an extremely slow rate. • It serves as reservoir of nutrients. 	1 1	2
	SECTION C		
22.	Oogonia (2n) in embryonic /foetal ovary ↓ Mitosis and Differentiation Primary oocyte(2n) ↓ I st meiotic division begins in foetal stage and gets arrested till puberty Secondary oocyte(n) and 1 st polar body ↓ 2 nd meiotic division completes upon entry of sperm ovum(n) and 2 nd Polar body	½ ½ ½ ½ ½	3
23.	<ul style="list-style-type: none"> • Blastocyst gets embedded in the endometrium of the uterus. • -Finger like projections appears on the trophoblast called Chorionic villi which are surrounded by uterine tissue and maternal blood. <p>-These tissues interdigitate with each other to form placenta.</p>	1 1 1	3
24.	(a) <p>-Carrier daughters- 50% of the daughters or 25% of the total offsprings. - Sufferer sons-50% of the sons or 25% of the total offsprings.</p> (b) <p>-Carrier daughters- 25% of the total offsprings. -Sufferer daughters- 25% of the total offsprings</p> <p style="text-align: center;">/</p> <p>-normal sons - 25% of the total offsprings -Sufferer sons- 25% of the total offsprings.</p> (c) Sex linked recessive disease/ criss -cross pattern of inheritance.	½ ½ ½ ½ / ½ ½ 1	3

	clone having the mutated gene will hence not appear on the photographic film because the probe will not have complementarity with the mutated gene.	1x3	3
28.	(a)The age pyramid structure is formed when the age distribution is plotted for the population / the percent individuals of a given age or age group is plotted for the population age pyramid is formed. (b) When the pre-reproductive group is larger than the reproductive age groups / When reproductive group is smaller than pre reproductive age groups.	1½ 1½	3
	SECTION D		
29.	(a) Polymerase Chain Reaction (b) (i) Very low concentration of a bacteria or virus (during early stages of infection) , can be detected by amplification of their nucleic acid by PCR. OR (b) (ii) <ul style="list-style-type: none"> • <i>Taq polymerase</i> is heat resistant enzyme/ thermostable/ does not get denatured at high temperature. • <i>Thermus aquaticus</i> / <i>Thermophilus aquaticus</i>. (c) <p style="text-align: center;">Denaturation (at high temperature)→ Annealing →Extension (of the primers)</p> <p style="text-align: center;">(If all three steps are correct then award 1 mark)</p>	1 1+1 1 1 1	4
30	(a) (i) <ul style="list-style-type: none"> • To conserve organisms for their economic cultural scientific and recreational value / to conserve biological diversity of wetlands. • It was named after the city ‘Ramsar’ in Iran. <p style="text-align: center;">OR</p>	1 1	

	(ii) (I) marshes, lakes, coral reefs, wetlands etc. (Any two) (II) Ashtamudi wetland (Kerela), Bhitarkanika Manaroues (Orissa), Bhojcutland (Madhya Pradesh), Chandra Taal (Himachal Pradesh) or any other site. (Any two) (b) Haiderpur wetland or any other correct example (c) Australia	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ 1 1	4
	SECTION E		
31	(a) <ul style="list-style-type: none"> • The process of formation of megaspore from megaspore mother cell • Large megaspore mother cell(2n) ↓ Meiosis I and II Megaspore tetrad (n) ↓ Three megaspore cells degenerate and one functional megaspore undergoes three mitotic nuclear divisions ↓ Leads to formation of embryo sac with eight nuclei ↓ Three nuclei grouped towards chalazal end, three nuclei towards micropylar end, and two polar nuclei in the centre ↓ Six of the eight nuclei are surrounded by cell wall and organised into cells (containing one egg cell between two synergids and three antipodal) , the remaining two nuclei (polar nuclei) are situated in the large central cell. <p style="text-align: center;">OR</p>	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} \times 3$ $\frac{1}{2} + \frac{1}{2}$	

	<p>(b) (i) Reasons can be physical, congenital, diseases, drugs, immunological, psychological (any Two)</p> <p>(ii)</p> <p>-<i>In vitro</i> fertilisation (IVF)–fertilisation occurs outside the body (in almost similar conditions as that in the body) followed by embryo transfer (ET), in this method ova from the wife or donor (female) and sperms from the husband or donor (male) are collected and are induced to form zygote under simulated conditions in the laboratory.</p> <p>-ZIFT (zygote intra fallopian transfer)-The zygote or early embryos (with upto 8 blastomeres) is then transferred into the fallopian tube to complete its further development .</p> <p>-In IUT (intra uterine transfer) embryos with more than 8 blastomeres are transferred into the uterus to complete its further development.</p>	<p>1+1</p> <p>$\frac{1}{2}+\frac{1}{2}$</p> <p>1</p> <p>1</p>	<p>5</p>
<p>32.</p>	<p>(a)</p> <p>The two strands of DNA are complementary to each other and highly stable, the presence of thymine at the place of uracil makes DNA more stable, 2'OH group present at every nucleotide in RNA is a reactive group and makes RNA labile and easily degradable, RNA mutates at faster rate than DNA, DNA being more stable is preferred for storage of genetic information.</p> <p style="text-align: center;">OR</p> <p>(b) (i)</p> <p>Oparin and Haldane proposed that the first form of life could have come from pre-existing non-living organic molecules(e.g. RNA, protein, etc.), and that formation of life was preceded by chemical evolution.</p> <p>(ii) S.L. Miller created electric discharge, in a closed flask containing CH₄, H₂, NH₃, and water vapour at 800⁰C, he observed formation of aminoacids.</p>	<p>1x5</p> <p>1+1</p> <p>$\frac{1}{2} \times 6$</p>	<p>5</p>

33	<p>(a)</p> <ul style="list-style-type: none"> • Caused by Chikungunya virus / alphavirus • Spread in human by bite of female <i>Aedes</i> mosquitoes. • Symptoms include fever, joint pain, muscle pain, headache, nausea, fatigue and rashes. <p style="text-align: center;">(Any four)</p> <ul style="list-style-type: none"> • Prevention -reduce open water filled spaces, use insecticides to kill mosquitoes larva, full cover clothing, introducing <i>Gambusia</i> fish in stagnant water that feed on mosquito larva. <p style="text-align: center;">(Any one correct prevention)</p> <p style="text-align: center;">OR</p> <p>(b) The primary effluent is passed into large aeration tanks and constantly agitated mechanically and air is pumped into it this give rise to flocs (masses of bacteria associated with fungal filaments to form mesh like structures) , which consume the major part of the organic matter in the effluent and reduces the BOD (biochemical oxygen demand) of the effluent, effluent is passed into settling tank where flocs are allowed to sediment and sediment is called activated sludge, major part of it is pumped into large tank called anaerobic sludge digesters here anaerobic bacteria digest the bacteria and fungi in the sludge and produce biogas(methane, hydrogen sulphide and carbon dioxide), and effluent is released into natural water bodies like rivers and streams.</p>	<p>1</p> <p>1</p> <p>½x4</p> <p>1</p> <p>1x5</p>	<p>5</p>