

Marking Scheme  
Strictly Confidential  
(For Internal and Restricted use only)  
SR. SECONDARY SCHOOL SUPPLEMENTARY EXAMINATION, 2025  
SUBJECT NAME : BIOLOGY (SUB. CODE-044)

**General Instructions: -**

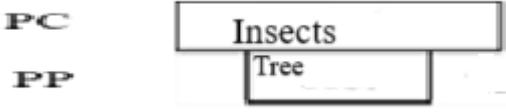
<b>1</b>	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
<b>2</b>	<b>“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 Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”</b>
<b>3</b>	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. <b>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.</b>
<b>4</b>	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.
<b>5</b>	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.
<b>6</b>	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. <b>This is most common mistake which evaluators are committing.</b>
<b>7</b>	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 “ <b>Extra Question</b> ”.
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 70 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). This is in view of the reduced syllabus and number of questions in question paper.
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"> <li>● Leaving answer or part thereof unassessed in an answer book.</li> <li>● Giving more marks for an answer than assigned to it.</li> <li>● Wrong totaling of marks awarded on an answer.</li> <li>● Wrong transfer of marks from the inside pages of the answer book to the title page.</li> <li>● Wrong question wise totaling on the title page.</li> <li>● Wrong totaling of marks of the two columns on the title page.</li> <li>● Wrong grand total.</li> <li>● Marks in words and figures not tallying/not same.</li> <li>● Wrong transfer of marks from the answer book to online award list.</li> <li>● 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.)</li> <li>● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</li> </ul>
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 unassessed 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 “ <b>Guidelines for Spot Evaluation</b> ” 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.

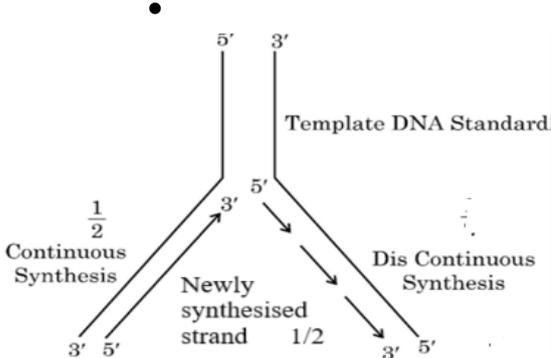
**MARKING SCHEME**  
**Senior Secondary School Supplementary Examination, 2025**  
**BIOLOGY (Subject Code-044)**  
**[Paper Code: 57/S/3]**

**MAXIMUM MARKS:70**

Q.No.	EXPECTED ANSWER / VALUE POINTS	MARKS	TOTAL MARKS				
<b>SECTION – A</b>							
1	(C) / Analogous structures and represent convergent evolution.	1	1				
2	(D) / Aa x aa	1	1				
3	(D) / (i), (iii) and (iv) only	1	1				
4	(C) / a – Hilum, b – Funicle, c – Embryo sac	1	1				
5	(A) / (i) and (iii)	1	1				
6	(D) / a– i, b – iii, c – iv, d – ii	1	1				
7	(A) / a- ii, b-iii c-iv, d-i	1	1				
8	(A) / Individual 1 and 3	1	1				
9	(C) / Pneumonia pathogen infects alveoli of the lungs, whereas common cold affects nose and respiratory passage but not lungs	1	1				
10	(B) / Annealing	1	1				
11	(D) / Chilled Ethanol	1	1				
12	(D) / fully developed foetus and placenta	1	1				
13	(B) / Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).	1	1				
14	(C) / Assertion (A) is true but Reason (R) is false.	1	1				
15	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	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				
<b>SECTION B</b>							
17	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Follicular phase</th> <th style="text-align: center;">Luteal Phase</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(a) From 5 to 14 days of menstrual cycle</td> <td style="text-align: center;">From 16-28 days of menstrual cycle.</td> </tr> </tbody> </table>	Follicular phase	Luteal Phase	(a) From 5 to 14 days of menstrual cycle	From 16-28 days of menstrual cycle.	<b>1</b>	
Follicular phase	Luteal Phase						
(a) From 5 to 14 days of menstrual cycle	From 16-28 days of menstrual cycle.						

	(b) Higher secretion of LH and FSH	Corpus Luteum secretes progesterone.	1	2
18	<p>(a)</p> <p>(i)</p>  <p>Shape is inverted</p> <p>(ii) No, Pyramid of energy is always upright as some amount of energy is always lost (as heat) or decreases on moving from one trophic level to the next trophic level.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p> <p>(i) Warm and moist environment favours the rate of decomposition</p> <p>(ii) x- Mammals, y- Amphibians.</p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2} \times 2</math></p> <p>1</p> <p><math>\frac{1}{2} \times 2</math></p>	2	
19	<p>(a) To produce a zygote one megaspore mother cell will undergoes one meiotic division to produce one ovule as it shows megasporic development therefore 100 meiotic divisions will take place to produce 100 zygotes,</p> <p>One microspore mother cell undergoes one meiotic division to produce four pollen grain therefore 25 meiotic division will take place to produce 100 zygotes or 100 pollen grains</p> <p>Total meiotic division <math>100 + 25 = 125</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(b) Microspore mother cell = 35 So, no. of Pollen grains = <math>35 \times 4 = 140</math> Megaspore mother cell = 35 So, no. of ovules = 35 (Monosporic development)</p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p>1</p>	2	
20	<p>(a)</p> <p>(i) Yes</p> <p>(ii) Since the blood group of husband and wife is B and A respectively, so their genotype can be <math>I^B i</math> and <math>I^A i</math> respectively</p> <p>Parents <math>I^B i</math>, and <math>I^A i</math></p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>		

	<p>Parents: Father X Mother  Blood group: A B  Genotype: <math>I^A i</math> <math>I^B i</math>  Gametes: <math>I^A</math> <math>i</math> <math>I^B</math> <math>i</math>  Children: <math>I^A I^B</math> <math>I^A i</math> <math>I^B i</math> <math>i i</math>  Blood group: AB A B O</p> <p style="text-align: center;">½Mark for blood group O of baby</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)  (i) The molecule 'X' is repressor  (ii) z gene codes for β-galactosidase  (iii) In the absence of lactose or inducer</p>	½	
21	<p>(a) Haemophilia  (b) Recessive  (c) Since human males have only one X sex-chromosome and male with single altered X sex-chromosome becomes haemophilic</p>	½ ½ 1	2
<b>SECTION C</b>			
22	<p>(a) It is highly addictive drug, it is depressant/ slows down body functions  (b) Diacetylmorphine, <i>Papaver somniferum</i>/poppy plant  (c) Infections like hepatitis B or HIV can be transmitted</p>	½ + ½ ½ + ½ 1	3
23	<p>Features of cloning vectors –</p> <p>-Origin of Replication (Ori):  This is the sequence of DNA from where replication starts /Any piece of foreign DNA linked to it is made to replicate within host cell / it also decides the copy number of the linked DNA.</p> <p>-Selectable marker:  helps in identifying and eliminating non-transformants and selectively permitting the growth of the transformants/ help in selection of recombinants</p> <p>-Cloning sites:  The vector should have a few preferably single recognition site to link the foreign DNA/The ligation of alien DNA is carried out at a restriction site present in one of the two antibiotic resistance genes</p> <p style="text-align: center;"><b>(Any other feature with correct explanation)</b></p>	½ ½ ½ ½ ½ ½	3

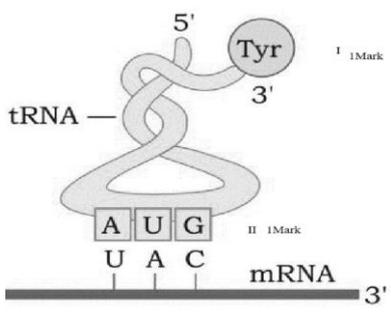
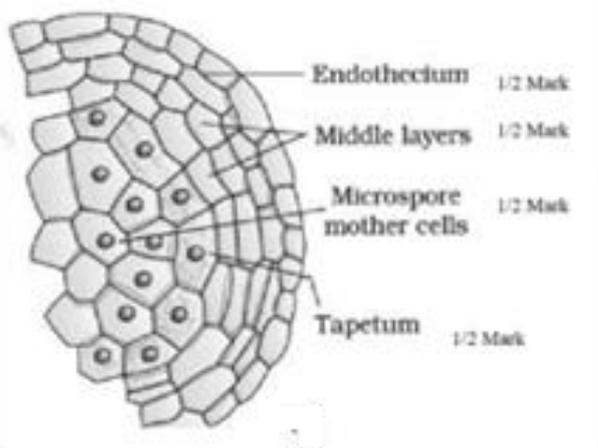
24	<p>(a)</p> <ul style="list-style-type: none"> <li>The contraceptive pills contain hormones like progestogen or combination of progestogen - estrogen</li> <li>Pills bring about the inhibition of ovulation and implantation / they act by altering the quality of cervical mucus to prevent or retard the entry of sperms / they prevent pregnancy</li> </ul> <p>(b) These pills have to be taken regularly for 21 days starting within first five days of menstrual cycle and to be repeated after a gap of 7 days / Saheli pill is to be taken once a week</p>	1 1 1	3
25	<p>On administration of first dose (L) of a vaccine the body response is of low intensity (X) as the immune system is coming in contact with weak antigens first time (Primary response), but on administration of second dose (M) with same antigen body response becomes intensified as secondary response (Y)</p> <p>-Because of formation of memory cells on first encounter with the antigen the secondary response is faster and stronger</p>	1+1  1	3
26	 <p style="text-align: center;"><b>(Any two correct labelling)</b></p> <p>Award marks for continuous and discontinuous synthesis only when polarity is correct.</p> <ul style="list-style-type: none"> <li>DNA dependent DNA polymerase,- causes polymerization of deoxyribonucleotides</li> <li>Ligase, Joins fragments of short discontinuous strand during DNA replication <b>(Any other enzyme with correct role)</b></li> </ul>	1/2  1/2+1/2  1/2+1/2  1/2+1/2	3

27	<p>(a) Protoxin or inactive protein present in Bt-cotton plant when ingested by Lepidopteran, gets converted into an active form of toxin due to alkaline pH of its gut, the activated toxin binds to the surface of midgut epithelial cells and creates pores, that causes cell swelling and lysis and eventually cause death of insect.</p> <p>(b) To achieve propagation of a large number of plants in very short durations or micropropagation, to obtain genetically identical plants to the original plant or soma clones, to recover healthy plant from diseased plants. <b>(Any two applications)</b></p>	<p><math>\frac{1}{2} \times 4</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>	3
28	<p>(a) Mediterranean orchid Ophrys uses 'sexual deceit' to get the pollination done by bees, the one of the petals of orchid resembles to female bees in size or colour or markings, the male bee visits to the petal as female bee (pseudo copulates) and get dusted from the pollens of flower, when the same bee 'pseudo copulates' with another flower it transfers the pollen to another flower</p> <p>(b) (i) Parasitism</p> <p>(ii) Commensalism</p>	<p><math>\frac{1}{2} \times 4</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	3
<b>SECTION C</b>			
29	<p>(a) Failure of segregation of chromatids during cell division cycle results in gain or loss of chromosome(s) called aneuploidy</p> <p>(b)</p> <ul style="list-style-type: none"> <li>• Klinefelter syndrome</li> <li>• Symptoms – Overall masculine development however the feminine development (development of breast/ Gynecomastia) is expressed, they are sterile, tall stature with feminized character <b>(Any two symptoms)</b></li> </ul> <p>(c) (i)</p> <ul style="list-style-type: none"> <li>• Presence of additional copy of a chromosome</li> <li>• Chromosome no. 21</li> </ul>	<p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	



	<b>OR</b>		
	(c) (ii) Tropical latitudes remained undisturbed for many years, Tropics are less seasonal, Constant environment, more Solar energy, Higher productivity, greater biodiversity <b>(Any two)</b>	$\frac{1}{2} + \frac{1}{2}$	4
	<b>SECTION D</b>		
<b>31</b>	<p>(a) (i) He realized that from the original seed eating features of the finches observed in Galapagos Island many other forms with altered beak arose, enabling them to become insectivorous and vegetarian finches, these process of evolution of different species in a given geographical area starting from a point, and literally radiating to other geographical area is called as adaptive radiation.</p> <p>(ii)</p> <ul style="list-style-type: none"> <li>• Allele frequencies in a population are stable and constant from generation to generation/ Sum total of all allelic frequencies in a population is 1</li> <li>• Gene flow /migration-migration of a section of population to another place,</li> </ul> <p>genetic drift – if alleles are added to the new population and are lost from old population by chance,</p> <p>Mutation – alteration in DNA,</p> <p>genetic recombination – crossing over during meiosis and sexual reproduction leads to new combinations and change in allelic frequency,</p> <p>natural selection – variations lead to new traits better suited to the environment are inheritable</p> <p style="text-align: center;"><b>(Any two factors with explanation)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>(b)(i) C – Template strand</p> <p style="padding-left: 40px;">D – Coding strand</p> <p style="padding-left: 40px;">Promotor is located towards 5' end of coding strand/ terminator is located at 3' end of coding strand</p>	$\frac{1}{2} \times 4$	
		1	
		1 x2	
		1 +1	
		$\frac{1}{2}$	

	<p>(ii) Two RNA molecules if produced simultaneously would be complementary to each other and will form a double stranded RNA so no translation and hence no protein will be formed/ If both strands act as template they would code for RNA molecule with different sequences &amp; in turn code for different proteins.</p> <p>(iii) - RNA polymerase I transcribes rRNAs (28S, 18S and 5.8S)</p> <p>- RNA polymerase II transcribes mRNA, heterogenous nuclear RNA</p> <p>- RNA polymerase III transcribes tRNA, 5srRNA and snRNAs</p>	<p>1</p> <p>½ x3</p>	<p>5</p>								
<p><b>32</b></p>	<p>(a) (i)</p> <p>(I) After industrialisation tree trunk became dark due to deposition of soot and smoke, so in that background dark winged moths could survive better than white so population of dark winged moths increased.</p> <p>(II) directional natural selection</p> <p>(ii) Hugo deVries – Single step large mutation or saltation leads to speciation.</p> <table border="1" data-bbox="247 1272 1161 1702"> <thead> <tr> <th data-bbox="247 1272 705 1332">Hugo deVries</th> <th data-bbox="705 1272 1161 1332">Darwin</th> </tr> </thead> <tbody> <tr> <td data-bbox="247 1332 705 1541">1. Single step large mutation causes evolution.</td> <td data-bbox="705 1332 1161 1541">1. minor variations causes evolution.</td> </tr> <tr> <td data-bbox="247 1541 705 1657">2. Mutations are random and directionless.</td> <td data-bbox="705 1541 1161 1657">2. variations are small and directional.</td> </tr> <tr> <td data-bbox="247 1657 705 1702">3. Evolution is sudden</td> <td data-bbox="705 1657 1161 1702">3. Evolution is gradual</td> </tr> </tbody> </table> <p style="text-align: center;"><b>(Any one difference)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p> <p>(i) (I) Sulphur is the component of protein and not of DNA so when they used radioactive sulphur(<sup>35</sup>S) it was incorporated into</p>	Hugo deVries	Darwin	1. Single step large mutation causes evolution.	1. minor variations causes evolution.	2. Mutations are random and directionless.	2. variations are small and directional.	3. Evolution is sudden	3. Evolution is gradual	<p>1+1</p> <p>1</p> <p>1</p> <p>1</p>	
Hugo deVries	Darwin										
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	<p>protein and no radioactivity was found in DNA, phosphorous is component of DNA and not of proteins so when they used radioactive phosphorous(<sup>32</sup>P) no radioactivity was found in protein it only incorporated in DNA, the bacteria infected with bacteriophage labelled with <sup>35</sup>S did not show any radioactivity ,while bacteria infected with bacteriophage labelled with <sup>32</sup>P showed radioactivity</p> <p>(II) They concluded that DNA is the genetic material not the protein</p> <p>(ii)</p> 	<p>½x4</p> <p>1</p> <p>1</p> <p>1</p>	<p>5</p>
<p>33</p>	<p>(a)</p> <p>(i)</p>  <p>(ii) It nourishes the developing pollen grains</p> <p>(iii) (I) Presence of sporopollenin in exine leads to preservation of pollen as fossil as it is most resistant organic material and can withstand high temperature and strong acid and alkali</p>	<p>½x4</p> <p>1</p> <p>1</p> <p>1</p>	

