



Hua Yi Secondary School
Science Department
Biology (6093)
Secondary Three Express
2023 Summative Review

Suggested Marking Scheme
Section A [20 marks]

1	2	3	4	5	6	7	8	9	10
C	A	D	D	B	D	C	D	D	B
11									
A									

Section B + C [50 + 10 marks]

1	(a)	The lactase will not be found within the milk , and will not have to be extracted after the process. OR The lactase can be reused from one batch of milk to the next, hence reducing the cost of the procedure. <i>R: Increased SA:vol ratio. Because SA:vol ratio is higher directly mixed compared to with beads. (Check students' understanding of SA:vol ratio)</i>	1
	(b)	If the diameter is increased, it can cause lactose to still be found within the milk that has flowed through the funnel. [1] This can occur because there is not enough time for the lactose to be fully digested by the lactase if the flow rate increases. [1]	2
	(c)	The milk produced will have lactose found in it. The hot milk will cause the lactase to denature, destroying the 3D structure of the active site / enzyme . [1] This prevents enzyme substrate complex from forming because the substrate no longer fits the active site. [1] leading to no products being formed. <i>MR:</i> - Many students did not mention about the ES complex formation as part of the explanation of the observations. - 'lost active site' instead of 'lost 3D structure of active site'	2
2	(a)	Organ X- Liver Blood vessel R- Hepatic artery Blood vessel Q- Hepatic portal vein Award 1m for two correct answers, 2m for three correct answers	2

	(b) • Concentration of amino acids in P higher than R • Concentration of glucose in P higher than R • Concentration of urea in P higher than R • Concentration of iron in P lower than R • Concentration of toxins in P lower than R • Concentration of oxygen in P lower than R Any three answers for three marks	3
	(c) The walls of R have thick muscular layers while the walls of P have only thin muscular layers. [1] This is so that R can withstand the high pressure of blood carried in it while P can have a thinner muscular wall because blood moves through it slowly / with lower pressure. [1] MR: - Many students failed to identify the cause of the thickness, which is due to musculature. - Many did not make comparisons, but instead only talking about R. Answering technique issue.	2
6	(a) P: All plots correct, accept 1 error A: Correct axes, with axes titles L: Best fit line / curve drawn. Penalise for extrapolation S: Graph occupies > 50% on both axes. Penalise for odd scale. A: Curve of best fit and line of best fit.	2

	(b) From 0 to 7 days of infection, the number of platelets decrease from $127 \times 10^9 / L$ to $40 \times 10^9 / L$. <i>R: Answers without data, or with wrong units.</i> <i>MR:</i> - "The platelet count $\times 10^9 / L$ decreases from ...". This is not an ideal way of presenting units. Ensure units are written with the value provided. Data presentation issue. - Many students missed the quoting of data here.	1
	(c) An injury can lead to bleeding. With low platelet count, the process of clotting may be slowed [1],	1
	and it may cause excessive blood loss, which can have severe consequences like death. [1]	
	(d) When there is an open wound, platelets convert soluble fibrinogen into insoluble fibrin threads. [1] The fibrin threads form a mesh, entangling blood cells and forming a clot across the wound. [1] This prevents the entry of microorganisms into the bloodstream. [1] <i>MR:</i> - Many students missed the initial reason (open wound) for the blood clot to even occur. Sensitivity to question issue. - "Platelets destroy pathogens." Content issue.	3

