

Question number	Answer	Notes	Marks
1 (a) (i)	1. distribute food / nutrients / eq; 2. distribute oxygen; 3. even out temperature / distribute heat;	2. ignore air 3. ignore maintain temperature constant	2
(ii)	1. optimum / best / suitable for enzymes; 2. prevent denaturation / prevent change to active site;	2. ignore death of microbes	2
(iii)	insulin / antibiotics / enzymes / hormones / yeast / amino acids / clotting factors / gibberellin / eq;	reject ethanol / beer / biogas / yoghurt / medicine / drugs	1
(b)	1. stop air supply / stop oxygen supply; 2. open pressure release valve / have exit pipe (for biogas) / eq;	1. ignore reduce air supply / remove air filter	2

Total 7 marks

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2 (a)	1. enzymes; 2. <u>optimum</u> (pH); 3. <u>denatured</u> ; 4. <u>active site</u> altered / eq; 5. maintain production / affect production / eq;	Ignore destroyed	3 max
(b)	1. water jacket / cooling water / eq; 2. insulation / eq; 3. temperature sensor / temperature probe / temperature recorder / thermostat / eq;	Ignore thermometer	max 2
(c)	1. oxygen; 2. <u>aerobic</u> respiration / eq; 3. mix / eq;		max 2
(d)	1. sterilise / aseptic / kills microorganisms / eq; 2. (cools to) water / condenses; 3. prevent competition from unwanted organisms / produce different product / eq; 4. prevent chemical contamination of product;		2 max
			Total 9 marks