

2023 YEAR 4 EXPRESS BIOLOGY COMMON TEST

Section A: Multiple Choice Questions (30 marks)

1	D	11	B	21	C
2	A	12	C	22	D
3	C	13	A	23	B
4	C	14	A	24	A
5	A	15	A	25	C
6	B	16	D	26	B
7	B	17	B	27	D
8	C	18	B	28	B
9	A	19	D	29	B
10	A	20	C	30	D

Section B: Structured Questions (50 marks)

1 (a)(i)	1: pulmonary vein 2: semi-lunar valve/ pulmonary valve 3: right atrium	[3]									
(ii)	<i>Y (left ventricle) has thicker/ more muscular wall than the X (right ventricle)</i> - more muscular force/contraction is required to generate a higher blood pressure - to push/ transport blood over a longer distance to the rest of the body organs / tissues / systemic circulation - there is also a greater resistance to blood flow to be overcome.	[3]									
(b)(i)	coronary artery	[1]									
(iii)	<i>max. 3</i> - damaged tissues and platelets release thrombokinase - which in presence of calcium ions, converts prothrombin into active thrombin - thrombin converts soluble fibrinogen into insoluble fibrin - fibrin threads form mesh to trap red blood cells and platelets stick to fibrin mesh, forming clot	[3]									
		[Total: 10]									
2 (a)(i)	- a chemical produced in small amounts by an endocrine gland - transported by blood (plasma) to the target organs where they alter the activity of target organ(s) - They are destroyed in the liver and excreted by the kidneys after they have carried out their functions.	[3]									
(ii)	<table border="1"> <thead> <tr> <th><i>hormone</i></th><th><i>uptake of glucose by cells</i></th><th><i>concentration of glucose in the blood</i></th></tr> </thead> <tbody> <tr> <td><i>insulin</i></td><td>increases</td><td>decreases</td></tr> <tr> <td><i>glucagon</i></td><td>decreases</td><td>increases/stays in the same</td></tr> </tbody> </table>	<i>hormone</i>	<i>uptake of glucose by cells</i>	<i>concentration of glucose in the blood</i>	<i>insulin</i>	increases	decreases	<i>glucagon</i>	decreases	increases/stays in the same	[2]
<i>hormone</i>	<i>uptake of glucose by cells</i>	<i>concentration of glucose in the blood</i>									
<i>insulin</i>	increases	decreases									
<i>glucagon</i>	decreases	increases/stays in the same									
(iii)	adrenaline	[1]									
(b)	<i>max. 4</i> - blood glucose concentration is kept constant/ within narrow limits (<i>makes reference to homeostasis</i>) - any deviation/ change from norm is detected/ acts as a stimulus - triggers corrective mechanism(s) - e.g. increased secretion of insulin to stimulate conversion of excess blood glucose to glycogen /ORA OR increased uptake of glucose by cells - to return concentrations/levels back to norm	[4]									
		[Total: 10]									
3 (a)(i)	8%	[1]									
(ii)	most amount of pollen grain germinated; longest length of pollen tube;	[2]									
(b)(i)	wind pollinated; protruding/feathery stigma	[2]									
(ii)	- pollen grain germinates in response to the sugary fluid secreted by the stigma - pollen tube grow out from the pollen grain and secretes enzymes to digest the surrounding tissue - travel down the stigma, style and ovary - enter through the micropyle - absorbs sap and burst, release the male gametes leading to fertilisation with the ovum	[5]									
		[Total: 10]									

4 (a)(i)	X: oestrogen Y: progesterone	[2]
(ii)	Any of the correctly stated roles X (oestrogen) - to repair and stimulate the thickening of the endometrium/uterine lining after menstruation - very high concentration, it indirectly stimulates ovulation Y (progesterone) - maintains the thickness of endometrium and ensures that it is richly supplied with blood capillaries. - increasing concentration of progesterone prevent ovulation	[2]
(b)(i)	A: placenta B: uterine lining/ endometrium	[2]
(ii)	- protect the foetus - provide space for movement of foetus - act as shock absorber - helps to lubricate the vaginal canal during birth	[4]
		[Total: 10]
5 (a)(i)	103 bubbles per min	[1]
(ii)	Any of the below: - duration for counting of bubbles / experiment (3 minutes) - temperature of water the plant is submerged in - concentration/volume of sodium hydrogencarbonate solution/ carbon dioxide supplied - species/ length/ size of water plant	[1]
(b)(i)	appropriate scale labelled axes and units correctly plotted data points best fit line	[4]
(ii)	43 ± 1 bubbles per min	[1]
(iii)	data values must be cited - As the distance from the plant to the light increases / light intensity decreases, the number of bubbles remains constant and then decreases - change in rate of bubble production per minute after 100 -139 cm	[2]
(iv)	for equilibration/ stabilisation to new conditions /AW	[1]
		[Total: 10]