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Mark Scheme (RESULTS)
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GCE O

GCE O Biology (7040/01)

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Paper 1

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1 (a)</td><td>
<table>
<tr><td>Drawing of red cells</td><td>red blood cells / eq;</td><td>transport oxygen;</td></tr>
<tr><td>Drawing of white cells</td><td>white blood cells / eq;</td><td>fight infection /
kills bacteria /
engulf pathogens /
phagocytosis /
antibody production / eq;</td></tr>
<tr><td>Drawing of platelets</td><td>Platelets</td><td>fibrin /
blood clotting /
prevent blood loss / eq;</td></tr>
</table>
</td><td>5</td></tr>
</table>

Question Number	Answer	Mark
1 (b)	haemoglobin ; (more) oxygen ; no nucleus ; (more) oxygen / haemoglobin ; biconcave / eq ; large surface area / (more) diffusion ; flexible ; squeeze through small vessels / eq ;	**max 4**

Question Number	Answer	Mark
2	nitrate / phosphate ; washed / washed out / leached /eq ; growth / reproduction / multiplication / number ; photosynthesis ; bacteria / fungi / microorganism ; oxygen ; fish / suitable aquatic animal / suitable named example ;	**7**

Question Number	Answer	Mark
3 (a)(i)	blood vessels constricted / narrower / smaller / thinner / vasoconstriction ;	**1**

Question Number	Answer	Mark
3 (a)(ii)	reduce heat loss / retain heat / eq ; by convection / radiation / eq ; maintain body temperature / keep body temp. constant / keeps blood warm ; protect internal organs / eq ;	**max 2**

Question Number	Answer	Mark
3 (b)(i)	oxygen / O_2 ; glucose / $C_6H_{12}O_6$;	**2**

Question Number	Answer	Mark
3 (b)(ii)	diffusion ; slow in cold / not in ice / needs fluid / eq ; blood vessels constricted / narrower / smaller / thinner / less blood flow / vasoconstriction ;	**max 2**

Question Number	Answer	Mark
4		

Growth	**division of cells / increase in number of cells / increase (organism) size / eq;**	Mitosis occurs in cells
Nutrition	**organisms obtain food substances / eq;**	Starch is produced in photosynthesis
Response	An organism reacts to an external stimulus	**plant shoot grows towards the light / eq;**
Control	An organism can control its internal conditions	**glucose level controlled by insulin / eq;**
Excretion	**removal of waste products from organism / eq;**	**carbon dioxide released by lungs / sweating / urea / urine / eq;**
Reproduction	**production of offspring / fusion of gametes / eq;**	Fertilisation in plants leads to seed formation

7

Question Number	Answer	Mark
5 (a)	XY ; X ; XY ;	**3**

Question Number	Answer	Mark
5 (b)	testis ;	**1**

Question Number	Answer	Mark
5 (c)	ovary ;	**1**

Question Number	Answer	Mark
5 (d)	fertilisation / fusion ;	**1**

Question Number	Answer	Mark
6 (a)(i)	(+) 0.07 ;	**1**

Question Number	Answer	Mark
6 (a)(ii)	2.5(%) ;; working e.g. 0.07 / 2.80 x 100 **ALLOW (1)** if answer incorrect	**2**

Question Number	Answer	Mark
6 (a)(iii)	easier to compare values / start from different masses / eq ;	**1**

Question Number	Answer	Mark
6 (b)	osmosis ; higher water potential outside potato / eq ; water flows into potato cells ;	**3**

Question Number	Answer	Mark
6 (c)	10% ; little or no change in mass ; least movement of water in or out ; explanation of "similar concentration" e.g. small concentration gradient / eq ;	**max 3**

Question Number	Answer	Mark
7 (a)(i)	algae / water plants → small fish → pike ;;	**2**

Question Number	Answer	Mark
7 (a)(ii)	correct shape ; correct order ;	**2**

Question Number	Answer	Mark
7 (a)(iii)	small fish ;	**1**

Question Number	Answer	Mark
7 (b)	protease / pepsin / pepsinogen ; amino acids / peptides / polypeptides ; HCl ; best / optimum pH / enzyme works fast ;	**max 2**

Question Number	Answer	Mark
7 (c)	decreases population size / eq ; less reproduction / fewer young /eq ;	**2**

Question Number	Answer	Mark
8 (a)(i)	rises / eq ; falls / eq ;	**2**

Question Number	Answer	Mark
8(a)(ii)	B lower ; (0-1 / 1st)hour (both) rise ; (1-2 / 2nd)hour B level constant but A continues to rise ; (2-3 / 3rd)hour B falls but A continues to rise ; (3-4 / 4th)hour B (slight) rise while A falls ; (4-5 / 5th)hour B (slight) rise while A falls ;	**max 4**

Question Number	Answer	Mark
8 (b)	A: blood glucose level rises higher / very slow to fall / eq ;	**1**

Question Number	Answer	Mark
8 (c)	insulin / glucagon ; pancreas /islets of Langerhans / alpha cells / beta cells ;	**2**

Question Number	Answer	Mark
9 (a)	<table><tr><td>AIDS</td><td>**virus ;**</td><td>**sex / body fluid / blood / eq ;**</td></tr><tr><td>**cholera / eq ;**</td><td>Bacteria</td><td>**contaminated water / food / sneezing ;**</td></tr><tr><td>Malaria</td><td>**protoctist / protist / *Plasmodium* ;**</td><td>**mosquito / insect ;**</td></tr></table>	**6**

Question Number	Answer	Mark
9 (b)	condoms / avoid sex / one partner / safe sex /screen blood / sterilise needles ; prevent virus ; prevent fluid exchange ;	**3**

Question Number	Answer	Mark
10 (a)	oxygen in water ; pumps / stirrers / replace water ; reduce predation ; use nets ; control disease ; use antibiotics / fungicides ; remove waste ; avoid oxygen depletion / anaerobic conditions / decomposition / disease / altering nutrient levels ; separate ages of fish ; avoid predation ; regulate feeding ; avoid leftovers / avoid oxygen depletion / anaerobic conditions / decomposition ; high protein food ; good growth ; selective breeding / genetic modification ; more suitable flesh quality at time of harvest / eq ; manipulation of sexes ; avoid males in stock (become aggressive at maturity) / eq ;	**max 4**

Question Number	Answer	Mark
10 (b)	lack of growth / stunted / kwashiorkor / marasmus ;	**1**

Question Number	Answer	Mark
11 (a)(i)	nucleus / mitochondria / eq ;	**1**

Question Number	Answer	Mark
11(a)(ii)	water + carbon dioxide ; oxygen ;	**2**

Question Number	Answer	Mark
11 (b)	Benedicts ; boil / heat / eq ; brick red / eq if positive or blue if negative ;	**3**

Question Number	Answer	Mark
11 (c)	(more) photosynthesis ; (more) glucose produced ; absorb red / don't absorb green / eq ;	**3**

Question Number	Answer	Mark
12(a)(i)	**A** trachea ; **B** bronchus ; **C** bronchiole ;	**3**

Question Number	Answer	Mark
12(a)(ii)	protect internal organs / heart / lungs / ventilation / breathing ;	**1**

Question Number	Answer	Mark
12(a)(iii)	(diaphragm) contracts / flattens / eq ; increases chest volume / reduces pressure ;	**2**

Question Number	Answer	Mark
12(b)	lung collapses / unable to expand / inflate ; no pressure change / pressure equal inside and outside chest ; less / no ventilation / can't breathe / air can't get in or out ;	**max 2**

Question Number	Answer	Mark
13	The number of waste products of human anaerobic respiration is **1** The number of chambers in the human heart is **4;** The number of different elements in glucose is **3;** The number of chromosomes in red blood cells is **0;** The number of trophic levels in a food chain that ends with a tertiary consumer is **4;** The number of cells produced after a zygote divides three times by mitosis is **8;**	**5**

TOTAL FOR PAPER: 100 MARKS