

Reproduction

Mark Scheme 5

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Reproduction
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 5

Time Allowed: 57 minutes

Score: /47

Percentage: /100

<p>1 (a)</p>	<p>narrow leaves ; parallel / unbranched, <u>veins</u> on leaves ; sheath / no petiole ; flower parts in multiples of 3 ; one cotyledon (in the seed) ; fibrous roots ; scattered vascular bundles ; no, cambium / woody tissue ;</p>	<p>[max 2]</p>	<p>Ignore long and thin unqualified</p>
<p>(b) (i)</p>	<p><i>pollination</i> pollen transferred, from anther, to stigma ; <i>fertilisation</i> gametes / sex cells / ova and pollen nuclei / sperm and egg, fuse / join / combine together ;</p>	<p>[max 2]</p>	<p>Ignore pollen unqualified Ignore meet / mix</p>
<p>(ii) 1 2 3 4 6 7 8</p>	<p>less variation / reduced gene pool / uniform crop ; less chance, for evolution to occur / adaption to new environment ; more chance to pass on genetic disease ; well adapted to environment ; no external agent of pollination required / more chance of fertilisation ; single plant can reproduce ; whole crop would be susceptible to adverse factors e.g. drought / disease ;</p>	<p>[max 2]</p>	<p>R no variation R no evolution R clones / asexual reproduction inferred</p>
<p>(c) 1 2 3 4 5 6 7 8</p>	<p>zygote (is formed) ; divides by mitosis ; to form embryo ; formation of radicle and plumule ; formation of, cotyledons / seed leaf / food reserve ; formation of, testa / seed coat ; ref to endosperm ; seed formed from ovule ;</p>	<p>[max 4]</p>	

1 (d)	1 energy is lost, between / within, trophic levels / along food chain ; <i>either</i> 2 animals are, at second trophic level / primary consumers <i>or</i> plants are, autotrophs / producers / first trophic level ; 3 (energy lost) in animal respiration / heat / (named) metabolic process / movement ; 4 ref to (more) material that is, inedible / not digestible (in longer food chains) ; 5 ref to 10% energy transfer / ORA ; 6 livestock require additional resources / cost for their maintenance ;	[max 3]	
		[Total:13]	

<p>2 (a)</p>	<p>pollen (grain) germinates / pollen (grain) grows pollen tube ; pollen tube grows down the style ; reaches the ovule ; (tip of) pollen tube breaks open ; male gamete(s) travels down the pollen tube ; male gamete(s) / (male) nucleus / nuclei, enter ovule ; (male gamete) fuses with female gamete / ovum ; zygote forms ;</p>	<p>max [3]</p>	<p>A pollen grain gametes / nucleus A fertilization / fusion, occurs inside the ovule</p>
<p>(b)</p>	<p><i>protection</i> (amnion / uterus / amniotic fluid) 1 provides protection against, mechanical damage / ‘knocks’ ; 2 provides sterile environment / no entry of pathogens ; 3 backbone provides protection against, jolts / AW ; 4 placenta provides a barrier to (named) pathogen(s) / AW ; 5 placenta prevents mixing of blood between fetus and mother</p> <p><i>constant temperature</i> 6 ref to blood flow to the, uterus / placenta / amnion ; 7 brings heat from elsewhere in mother’s body ; 8 removes heat from amniotic fluid ; 9 fetus enclosed inside, any named structure / the mother’s body ; 10 named structure(s), acts as insulators / reduces heat loss ;</p> <p><i>nutrients</i> 11 across placenta / through placenta ; 12 diffusion / active transport ; 13 between mother’s blood and fetal blood / into fetal blood;</p> <p><i>excretion of metabolic waste</i> 14 across placenta / through placenta ; 15 diffusion of, urea / carbon dioxide ; 16 from fetal blood to mother’s blood / into mother’s blood ;</p> <p><i>nutrients / excretion</i> A once only 17 umbilical cord transports, nutrients / excretory products ;</p>	<p>max [8]</p>	<p>max 3 from each section</p> <p>A baby for fetus</p> <p>R amniotic sac as insulator</p> <p>R absorbed by placenta</p>
<p>[Total:11]</p>			

Question		Answers	Marks	Additional Guidance
3	(a)	<p>transfer, of (named) pathogen/disease, from (infected) to (uninfected) person/animal/organism ;</p> <p>a (named) medication/substance, taken into the body that, modifies/affects/influences, (chemical reactions in) the body ;</p>	[2]	<p>A (harmful) microorganism/bacteria/virus/fungus for pathogen</p> <p>A infected by/passed down for 'transfer'</p> <p>R named non-human organisms</p>
	(b)	<p>1 (named) pathogens of water/(formula) milk ;</p> <p>2 (named) water-borne diseases ;</p> <p>3 (new born) babies have, weak/no, immune systems ; AW</p> <p>4 few(er) antibodies from mother (as no breast milk) ;</p> <p>5 ref to HIV infects lymphocytes/white blood cells/weakens immune system ;</p> <p>6 no/few, lymphocytes/white blood cells ;</p> <p>7 few/no, antibodies produced ;</p> <p>8 then phagocytes are less effective ;</p> <p>9 stomachs do not produce much acid ;</p> <p>10 diarrhoea/vomiting ;</p> <p>11 dehydration/loss of, water/ions ;</p>	[max 4]	<p><i>for MP1</i></p> <p>A contamination of, water/bottle</p> <p>A (harmful) microorganism/bacteria/virus/fungus for pathogen</p> <p>ignore germs</p> <p><i>for MP3 ignore</i> children</p>

3	(c)	<ol style="list-style-type: none"> 1 bonding with mother ; 2 it's free/'cheap' ; 3 sterile/no risk of infection from, formula milk/bottled milk ; 4 is at, body/correct, temperature ; 5 no preparation/easily available ; 6 provides, best/complete/most suitable/AW, food ; 7 easier to digest ; 8 contains antibodies/ref to colostrum/provides passive immunity ; 9 provides protection against, pathogens/diseases/microorganisms ; 10 reduce risk of allergies ; 11 contraceptive effect ; 12 AVP ; 		[max 4]	<p><i>examples of AVPs for MP12</i></p> <p>no additives further antibody detail, e.g. diseases that the mother has had/common diseases ; composition/quantity, of breast milk changes to match development of baby ; protects against, <u>breast</u> cancer/<u>ovarian</u> cancer ; helps the body to return to 'normal' e.g. weight loss/restores uterus ;</p>
3	(d)	<ol style="list-style-type: none"> 1 (unprotected/AW) sexual intercourse/from semen/vaginal fluids ; 2 sharing, needles/syringes ; 3 blood/blood product, for transfusion/transplants/blood to blood contact ; ignore blood unqualified 		[max 2]	<p>A 'sex' R saliva/tears/sweat/urine R donating blood R skin contact R kissing R (genetically) inherited</p> <p>ignore other sharps, e.g. tattoo needles/razors unless qualified by blood contact ignore unqualified body fluids/breast milk/placenta</p>
[Total: 12]					

<p>4 (a) (i)</p>	<table border="1"> <tr> <td data-bbox="353 261 636 320">circulatory system</td> <td data-bbox="636 261 1227 320">blood vessels that carry oxygenated blood</td> </tr> <tr> <td data-bbox="353 320 636 379">maternal</td> <td data-bbox="636 320 1227 379">;</td> </tr> <tr> <td data-bbox="353 379 636 438">fetal</td> <td data-bbox="636 379 1227 438">Y / Y and X ;</td> </tr> </table>	circulatory system	blood vessels that carry oxygenated blood	maternal	;	fetal	Y / Y and X ;	<p>[2]</p>
circulatory system	blood vessels that carry oxygenated blood							
maternal	;							
fetal	Y / Y and X ;							
<p>(ii)</p>	<p>umbilical cord ; <i>Any one of the following:</i></p> <p>tied / clamped ; cut ; (part attached to mother) comes away with placenta ; (part attached to baby) drops off ;</p>	<p>[2]</p>						
<p>(iii)</p>	<p>oxygen, from maternal / to fetal ; MP2 carbon dioxide, from fetal / to maternal ; MP3 named nutrients from maternal / to fetal ; MP4 water, either direction or both ; MP5 antibodies, from maternal / to fetal ; MP6 urea / nitrogenous waste, from fetal / to maternal ; MP7 passage of hormones, from maternal / to fetal / both directions ; MP8 diffusion in correct context ; MP9 active transport in correct context ; (amino acids)</p>	<p>[max 4]</p>						
<p>(b)</p>	<p><i>oestrogen and progesterone</i></p> <p>MP1 develops, (lining of) uterus / endometrium ; MP2 prevent, shedding of lining / menstruation ; MP3 inhibit (release of) FSH ; MP4 by pituitary gland ; MP5 prevent egg cells / follicles, developing (in ovary) / ovulation ; MP6 promote development / growth, of mammary glands ;</p>	<p>[max 3]</p>						
		<p>[Total: 11]</p>						