

<p><b>1 (a)</b></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><b>Ignore</b> long and thin unqualified</p>
<p><b>(b) (i)</b></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><b>Ignore</b> pollen unqualified <b>Ignore</b> meet / mix</p>
<p><b>(ii)</b></p>	<p><b>1</b> less variation / reduced gene pool / uniform crop ; <b>2</b> less chance, for evolution to occur / adaption to new environment ; <b>3</b> more chance to pass on genetic disease ; <b>4</b> well adapted to environment ; <b>6</b> no external agent of pollination required / more chance of fertilisation ; <b>7</b> single plant can reproduce ; <b>8</b> whole crop would be susceptible to adverse factors e.g. drought / disease ;</p>	<p>[max 2]</p>	<p><b>R</b> no variation <b>R</b> no evolution <b>R</b> clones / asexual reproduction inferred</p>
<p><b>(c)</b></p>	<p><b>1</b> zygote (is formed) ; <b>2</b> divides by mitosis ; <b>3</b> to form embryo ; <b>4</b> formation of radicle and plumule ; <b>5</b> formation of, cotyledons / seed leaf / food reserve ; <b>6</b> formation of, testa / seed coat ; <b>7</b> ref to endosperm ; <b>8</b> seed formed from ovule ;</p>	<p>[max 4]</p>	

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

2 (a)	<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>	max [3]	<p><b>A</b> pollen grain gametes / nucleus  <b>A</b> fertilization / fusion, occurs inside the ovule</p>
(b)	<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> <b>A</b> once only  17 umbilical cord transports, nutrients / excretory products ;</p>	max [8]	<p><b>max 3</b> from each section</p> <p><b>A</b> baby for fetus</p> <p><b>R</b> amniotic sac as insulator</p> <p><b>R</b> absorbed by placenta</p>
<b>[Total:11]</b>			

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

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

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