

Question number	Answer	Notes	Marks
1 (a)	(transfer) pollen from <u>anther</u> to <u>stigma</u> ;	ignore stamen to carpel/style ignore male to female gamete	1
(b)	1. o make honey / food; 2. sugar(y) / sucrose / glucose / fructose; 3. energy / respiration;	2. ignore carbohydrate	2
(c)	(can) produce offspring / (can) reproduce / eq;	ignore egg / gamete / babies / children production ignore fertilisation	1
(d)	1. utation; 2. (different) allele / different version of a gene / DNA / genetically different / eq; 3. resistant / resistance; 4. idea of survival; eg not all die from disease	2. ignore different gene 3. ignore immune	2
(e)	16;		1

Question number	Answer	Notes	Marks
(f)	<p>1. the number of <u>drones</u> the queen mates with / queen may mate with different <u>drones</u>;</p> <p>2. each drone has a different set of alleles / is genetically different;</p> <p>3. (queen's eggs made by) meiosis / have different alleles / eq;</p>	<p>ignore bees</p> <p>ignore mutation</p> <p>ignore genes</p>	2
(g)	<p>1. disease resistant;</p> <p>2. large quantity of honey / beeswax ;</p> <p>3. ability to collect nectar;</p> <p>4. fecundity / more bees / eq;</p> <p>5. less aggressive / eq;</p>	<p>1. ignore immune / combat disease / live longer / hardier</p> <p>2. ignore taste / flavour / quality of honey</p>	2

(Total for Question = 11 marks)

Question number	Answer	Notes	Marks											
2 (a)	(i) transfer oxygen / nutrients / named nutrient / water / carbon dioxide / waste / named waste / antibodies / release progesterone;  reject if linked to exchange of blood	allow examples of named nutrient eg protein ignore food	1											
	(ii) cushions / protects (from physical damage) / shock absorber / supports / eq;	protects must be qualified eg from bumps  ignore keeps fetus safe / insulated	1											
	(iii) antibodies;		1											
(b)	(i) 46 / 23 <u>pairs</u> ;		1											
	(ii) <table border="1"> <thead> <tr> <th>Sex chromosomes</th> <th>tick</th> </tr> </thead> <tbody> <tr> <td>XX</td> <td></td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td>XY</td> <td>✓</td> </tr> <tr> <td>YY</td> <td></td> </tr> <tr> <td>Y</td> <td></td> </tr> </tbody> </table>	Sex chromosomes	tick	XX		X		XY	✓	YY		Y		No mark if more than one tick
Sex chromosomes	tick													
XX														
X														
XY	✓													
YY														
Y														

Question number	Answer	Notes	Marks
(c) (i)	1. calcium / Ca; 2. vitamin D; 3. protein;		2
(ii)	1. more mass / heavier / extra weight; 2. growth / development / division / respiration of fetus / eq;	she has a fetus alone = 0 / she needs to feed the fetus = 0 / more energy to carry baby = 0 / energy for fetus = 0  ignore prevent anaemia / more iron for baby	2
(iii)	1. <u>red</u> blood cells; 2. haemoglobin; 3. oxygen; 4. respiration;		3

(Total for Question = 12 marks)

Question number	Answer	Notes	Marks												
3 (a)	<table border="1"> <thead> <tr> <th>Process</th> <th>genetic variation in offspring</th> </tr> </thead> <tbody> <tr> <td>runners producing new plants</td> <td>(x)</td> </tr> <tr> <td>micropropagation</td> <td>x</td> </tr> <tr> <td>wind-pollination</td> <td>✓</td> </tr> <tr> <td>taking cuttings</td> <td>x</td> </tr> <tr> <td>self-pollination of a flower</td> <td>✓</td> </tr> </tbody> </table>	Process	genetic variation in offspring	runners producing new plants	(x)	micropropagation	x	wind-pollination	✓	taking cuttings	x	self-pollination of a flower	✓		4 correct = 3 2 or 3 correct = 2 1 correct = 1
Process	genetic variation in offspring														
runners producing new plants	(x)														
micropropagation	x														
wind-pollination	✓														
taking cuttings	x														
self-pollination of a flower	✓														
(b)	<ol style="list-style-type: none"> <li>1. male gamete/sperm/nucleus AND female gamete/egg/nucleus / haploid / 23 chromosomes;</li> <li>2. fuse / join / combine / eq;</li> <li>3. <u>zygote</u> / diploid / 46 chromosomes;</li> <li>4. <u>mitosis</u> / cell division;</li> <li>5. hree times / 2, 4 then 8 / three divisions;</li> </ol>		4												

(Total for Question = 7 marks)

Question number	Answer	Notes	Marks
4 (a) (i)	flask A 22 and flask B 18 (both temperatures correct) ;	units not required	1
(ii)	<u>respiration</u> ; heat released / eq;	allow converse ignore energy / warmth	2
(b)	kill bacteria / kill microorganisms / remove bacteria / no bacteria / fewer bacteria / sterilise / eq;	ignore other organisms	1
(c)	oxygen (in) / carbon dioxide (out);	ignore air / gas / gas exchange; reject oxygen out alone / carbon dioxide in alone eg to allow oxygen in and out = 1 allow movement of oxygen / carbon dioxide	1
(d)	mass / number / age / amount (of seeds) / eq;	ignore health / time / outside temperature ignore size	1
		<b>Total</b>	

Question number	Answer	Notes	Marks
5 (a)	(i) 15;		1
	(ii) 14 or 15;		1
	(iii) 1. the oometer; 2. clinical / digital / mouth / ear / rectum / anus / armpit / eq;		2
(b)	(i) oes	allow estrogen / estradiol	1
	(ii) progesterone;		1
	(iii) blood / plasma;	allow blood vessel / blood stream	1
	(iv) 1. breasts / mammary glands / nipples / eq; 2. body shape / wide hips / eq; 3. body hair / pubic hair / eq; 4. menstruation / period / menstrual cycle / ovulation / eq;	reject characteristics only shown by males ignore facial hair ignore voice  ignore psychological changes ignore sex drive	2

Total 9 marks

Question number	Answer	Notes	Marks
6	<p>(a)(i) 1. gain entry / break through egg membrane / break into egg / penetrate egg / eq;</p> <p>2. chromosomes / DNA / genes / alleles / genetic material;</p> <p>(ii) 1. respiration;</p> <p>2. ATP / energy;</p> <p>(iii) swim / move / eq;</p>	<p>1. Ig re digest / fertilise</p> <p>2. Ignore nucleus</p>	<p>2</p> <p>2</p> <p>1</p>
	<p>(b) 1. dendrites connect with other neurones / eq;</p> <p>2. axon carries/allows impulse / eq;</p> <p>3. myelin sheath for protection / insulation / faster impulse / eq;</p> <p>4. connected to muscle fibres / allows impulse to reach muscle fibres / enables muscle fibres to contract / synapses with muscle fibres;</p>		<p>Max 2</p>