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

(Total for Question = 11 marks)

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>2 (a) (i)</td><td>transfer oxygen / nutrients / named nutrient / water / carbon dioxide / waste / named waste / antibodies / release progesterone;

reject if linked to exchange of blood</td><td>allow examples of named nutrient eg protein
ignore food</td><td>1</td></tr>
<tr><td>(ii)</td><td>cushions / protects (from physical damage) / shock absorber / supports / eq;</td><td>protects must be qualified eg from bumps

ignore keeps fetus safe / insulated</td><td>1</td></tr>
<tr><td>(iii)</td><td>antibodies;</td><td></td><td>1</td></tr>
<tr><td>(b) (i)</td><td>46 / 23 <u>pairs</u>;</td><td></td><td>1</td></tr>
<tr><td>(ii)</td><td><table><tr><th>Sex chromosomes</th><th>tick</th></tr><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></table></td><td>No mark if more than one tick</td><td>1</td></tr>
</table>

Question number	Answer	Notes	Marks
(c) (i)	1. alcium / 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. aemoglobin; 3. xygen; 4. respiration;		3

(Total for Question = 12 marks)

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>3 (a)</td><td>
<table>
<tr><th>Process</th><th>genetic variation in offspring</th></tr>
<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>
</table>
</td><td></td><td>4 correct = 3
2 or 3 correct = 2
1 correct =1</td></tr>
<tr><td>(b)</td><td>1. male gamete/sperm/nucleus AND
female gamete/egg/nucleus /
haploid / 23 chromosomes;
2. fuse / join / combine / eq;
3. zygote / diploid / 46 chromosomes;
4. mitosis / cell division;
5. hree times / 2, 4 then 8 / three divisions;</td><td></td><td>4</td></tr>
</table>

(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
		Total	

Question number	Answer	Notes	Marks
5 (a) (i)	15;		1
(ii)	14 or 15;		1
(iii)	1. the ometer; 2. cli cal / 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. br sts / mammary glands / nipples / eq; 2. body ape / wide hips / eq; 3. body hai / pubic hair / eq; 4. men ruation / 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 (a)(i)	1. gain entry / break through egg membrane / break into egg / penetrate egg / eq; 2. chromosomes / DNA / genes / alleles / genetic material;	1. Ig re digest / fertilise 2. Ignore nucleus	2
(ii)	1. respiration; 2. ATP / energy;		2
(iii)	swim / move / eq;		1
(b)	1. dendrites connect with other neurones / eq; 2. axon carries/allows impulse / eq; 3. myelin sheath for protection / insulation / faster impulse / eq; 4. connected to muscle fibres / allows impulse to reach muscle fibres / enables muscle fibres to contract / synapses with muscle fibres;		Max 2