

# Reproduction

## Mark Scheme 5

<b>Level</b>	IGCSE(9-1)
<b>Subject</b>	Biology
<b>Exam Board</b>	Edexcel IGCSE
<b>Module</b>	Single Award (Paper 2B)
<b>Topic</b>	Reproduction and Inheritance
<b>Sub-Topic</b>	Reproduction
<b>Booklet</b>	Mark Scheme 5

**Time Allowed:** 63 minutes

**Score:** /52

**Percentage:** /100

**Grade Boundaries:**

9	8	7	6	5	4	3	2	1
>90%	80%	70%	60%	50%	40%	30%	20%	10%

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. to 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. mutation; 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. the number of <u>drones</u> the queen mates with / queen may mate with different <u>drones</u> ; 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)

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	1
Sex chromosomes	tick														
XX															
X															
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YY															
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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. <u>haemoglobin</u> ; 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	✓		<p>4 correct = 3 2 or 3 correct = 2 1 correct = 1</p>
Process	genetic variation in offspring														
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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. thermometer; 2. clinical / digital / mouth / ear / rectum /anus / armpit / eq;		2
(b)	(i) oestrogen	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; 2. chromosomes / DNA / genes / alleles / genetic material;</p> <p>(ii) 1. respiration; 2. ATP / energy;</p> <p>(iii) swim / move / eq;</p>	<p>1.Ignore digest / fertilise 2. Ignore nucleus</p>	<p>2</p> <p>2</p> <p>1</p>
	<p>(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;</p>		<p>Max 2</p>