

Question number	Answer	Notes	Marks
1 (a)	1. random <u>fertilisation</u> of gametes / eq; 2. variation / mixing genetic material / genes/alleles from both parents / genetically different offspring / eq; 3. meiosis / eq;	allow random assortment / crossing over	2
(b) (i)	1. no petals / small petals; 2. exposed stigma / feathery stigma / eq; 3. exposed anthers / exposed filament / long filaments / exposed stamen / long stamen / eq;	ignore colour / scent	2
(ii)	1. no nectar / no nectary; 2. no scent / no smell; 3. no colour / not bright / eq;	ignore sweet / sugar	2

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(c) (i)	1. more pollen; 2. lighter pollen / smaller pollen / eq; 3. <u>pollen</u> is airborne / eq;	allow converse ignore carried by wind	1
(ii)	flowers appear / reproduce at different times / release pollen at different times / eq;	ignore wind at different times of year	1
(iii)	1. white blood cells / phagocytes / lymphocytes; 2. ingest / digest / phagocytosis / eq; 3. <u>antibodies / antitoxins</u> ; 4. <u>antigens</u> ; 5. memory cells;		3

(Total for Question = 11 marks)

Question number	Answer	Notes	Marks
2 (a)	23;	reject 23 pairs	1
(b)	energy / ATP; swim / move / move tail / travel / eq;		2
(c)	24 million / 24,000,000;;	allow one for 60 in working	2
(d) (i)	(not) using oxygen / oxygen still present; (not) respiring; few sperm / eq; poor swimmers / eq;	ignore man infertile ignore dead sperm	2
(ii)	1 seal broken / oxygen getting in / not airtight / eq; 2 (semen) sample too small; 3 kept less than one hour / eq; 4 not kept at 37°C / not at correct temperature eq; 5 only done once / anomalous result / eq;	ignore sperm reject idea that 37°C kills	max 2
		Total	9

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3	<table border="1"> <thead> <tr> <th data-bbox="436 308 893 381">event</th> <th data-bbox="893 308 1317 381">letter</th> </tr> </thead> <tbody> <tr> <td data-bbox="436 381 893 453">fertilisation</td> <td data-bbox="893 381 1317 453">(P)</td> </tr> <tr> <td data-bbox="436 453 893 526">release of oestrogen</td> <td data-bbox="893 453 1317 526">Q; ONLY</td> </tr> <tr> <td data-bbox="436 526 893 598">meiosis</td> <td data-bbox="893 526 1317 598">Q and V; ONLY in any order</td> </tr> <tr> <td data-bbox="436 598 893 671">repair of the uterus lining</td> <td data-bbox="893 598 1317 671">R; ONLY</td> </tr> <tr> <td data-bbox="436 671 893 743">implantation of an embryo</td> <td data-bbox="893 671 1317 743">R; ONLY</td> </tr> <tr> <td data-bbox="436 743 893 816">formation of gametes</td> <td data-bbox="893 743 1317 816">Q and V; ONLY in any order</td> </tr> </tbody> </table>	event	letter	fertilisation	(P)	release of oestrogen	Q; ONLY	meiosis	Q and V; ONLY in any order	repair of the uterus lining	R; ONLY	implantation of an embryo	R; ONLY	formation of gametes	Q and V; ONLY in any order	<p>only give mark if correct letter(s) given one correct and one wrong = 0 allow lower case letters</p>	5
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4 (a)	runners / corms / bulbs / tubers / rhizomes;			ignore cuttings / cloning / vegetative propagation / micropropagation / tissue culture	1
(b)	Feature	Sexual reproduction in plants	Sexual reproduction in animals		3
	male gametes	(pollen nucleus)	sperm;		
	site of fertilisation	<u>ovule</u> ;	oviduct / fallopian tube / eq;		
(c)	<p>1. indication of number and size difference; eg .more sperm + smaller / less eggs + larger / more sperm + larger egg / less eggs + smaller sperm</p> <p>2. sperm: better chance of fertilisation / swim easier / eq egg: more cytoplasm / more nutrition / eq;</p>				2

Total 6 marks

Question number	Answer	Marks
5 (a)	A: <u>stigma</u> ; B: <u>anther</u> ; R antler	
(b)	transfer of pollen (by insect); from anther/stamen to stigma;	2
(c)	petals/flower smaller / less bright / less attractive /eq; stamens/anthers outside flower / exposed / larger /eq; style/stigma outside flower / exposed / larger / eq; stigma feathery / eq; no <u>nectary</u> ; Ignore ref. to pollen/scent/nectar	Max 2
(d)	germinates; (pollen) tube; (grows down) style; <u>digestion</u> / <u>enzymes</u> ; (enters) ovule; ovary; micropyle; (male) nucleus / (pollen grain) nucleus / male gamete; fertilisation / fuse / join / eq; ovum / egg / nucleus / female gamete; ovule becomes seed; ovule wall becomes seed coat / testa; ovary becomes fruit; allow if labelled on diagram	Max 6

Question number	Answer	Marks
6 (a) (i)	only expressed if homozygous / only expressed if both alleles recessive / only expressed if homozygous recessive / hidden/not expressed / eq; Ignore not dominant/weaker/overpowered	1
(ii)	DD / homozygous dominant; Dd / heterozygous;	2
(b) (i)	Dd <u>and</u> Dd; DD and Dd and Dd and dd in any order; allow if different symbols but not X and Y	2
(ii)	75% / $\frac{3}{4}$ / 0.75 / eq; allow 3 out of 4 / 3 in 4	1
(iii)	3:1 / 1:3;	1
(c)	less blood; (less) glucose; (less) oxygen; (less) (aerobic) respiration / more <u>anaerobic</u> respiration; lactic acid; increase in rate / heart works harder; increase in pressure; coronary artery; angina; <u>clot</u> ; death / heart disease / heart attack / eq;	Max 5

Total 12 Marks