Question number	Answer	Notes	Marks
1 (a)	1. random fertilisation of gametes / eq; 2. variation / mixing genetic material / genes/alleles from both parents / genetically different offspring / eq; 3. eiosis / eq;	 allow random assortment / crossing over	2
(b) (i)	1. o petals / small petals; 2. exposed stigma / feathery stigma / eq; 3. xposed 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

Question number	Answer	Notes	Marks
(c) (i)	1. ore pollen; 2. lighter pollen / smaller pollen / eq; 3. pollen is <u>air</u>borne / 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. emory cells;		3

(Total for Question = 11 marks)

Question number	Answer	Notes	Marks
2 (a)	23;	reject 23 pairs	1
(b)	ener / 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 37^0C / not at correct temperature eq; 5 only done once / anomalous result / eq;	ignore sperm reject idea that 37^0C kills	max 2
		Total	**9**

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>3</td><td>
<table>
<tr><th>event</th><th>letter</th></tr>
<tr><td>fertilisation</td><td>(P)</td></tr>
<tr><td>release of oestrogen</td><td>Q; ONLY</td></tr>
<tr><td>meiosis</td><td>Q and V; ONLY in any order</td></tr>
<tr><td>repair of the uterus lining</td><td>R; ONLY</td></tr>
<tr><td>implantation of an embryo</td><td>R; ONLY</td></tr>
<tr><td>formation of gametes</td><td>Q and V; ONLY in any order</td></tr>
</table>
</td><td>only give mark if correct letter(s) given
one correct and one wrong = 0
allow lower case letters</td><td>5</td></tr>
<tr><td></td><td></td><td>Total</td><td>5</td></tr>
</table>

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>4 (a)</td><td>runners / corms / bulbs / tubers / rhizomes;</td><td>ignore cuttings / cloning / vegetative propagation /micropropagation /tissue culture</td><td>1</td></tr>
<tr><td>(b)</td><td><table>
<tr><td>Feature</td><td>Sexual reproduction in plants</td><td>Sexual reproduction in animals</td></tr>
<tr><td>male gametes</td><td>(pollen nucleus)</td><td>sperm;</td></tr>
<tr><td>site of fertilisation</td><td>ovule;</td><td>oviduct / fallopian tube / eq;</td></tr>
</table></td><td></td><td>3</td></tr>
<tr><td>(c)</td><td>1. indication of number and size difference;
eg .more sperm + smaller / less eggs + larger / more sperm + larger egg / less eggs + smaller sperm

2. erm: better chance of fertilisation / swim easier / eq
egg: more cytoplasm / more nutrition / eq;</td><td></td><td>2</td></tr>
</table>

Total 6 marks

Question number	Answer	Marks
5 (a)	A: stigma; B: anther; 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 nectary; Ignore ref. to pollen/scent/nectar	Max 2
(d)	germinates; (pollen) tube; (grows down) style; digestion / enzymes; (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

Total 12 Marks

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 and Dd; DD and Dd and Dd and dd in any order; allow if different symbols but not X and Y	2
(ii)	75% / ¾ / 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 anaerobic respiration; lactic acid; increase in rate / heart works harder; increase in pressure; coronary artery; angina; clot; death / heart disease / heart attack / eq;	Max 5

Total 12 Marks