1 (a (i)	hair / fur / whiskers ; external ears / pinna(e) ; nose / snout ;	max [1]	
(ii)	go to 2 ; go to 3 ; go to 4 ; go to 5 ; *Phascolarctos cinereus* **C** *Vombatus ursinus* **B** *Sminthopsis longicaudata* **A** *Macropus rufus* **D** *Paljara tirarense* **F** go to 6 ; *Sarcophilus harrisii* **E** *Dasyurus maculatus* G	[3]	5 or 6 correct = 3 3 or 4 correct = 2 1 or 2 correct = 1

(b) (i)	meiosis ;	[1]	
(ii)	maintains / increases, population ; allows variation ; **ora** adaptation to, new / changed, environment(s) ; natural selection / evolution / formation of new species ; AVP ; e.g. two parents contribute to survival of offspring e.g. allows expression of recessive, alleles / traits / genes	[3]	**ignore** survival unqualified
(c)	gas exchange / named example with direction ; transfer of (dissolved) nutrients, from maternal (circulation) / to fetal ; transfer of excretory products, from fetal / to maternal ; by diffusion ; produces / secretes, (named) hormone ; passive immunity / antibodies, from maternal / to fetal ; prevents / limits, mixing of blood ; ref to regulating blood pressure ; AVP ; e.g. maternal / fetal <u>attachment</u> point e.g. *ref to* counter current flow / maintains concentration gradient e.g. hormone function describ	max [4]	**ignore** food / nutrition for nutrients **A** glucose / amino acids / ions / water **A** urea / (nitrogenous) waste **A** progesterone / oestrogen / HCG / HPL / HCS
(ii)	protection from (mechanical) shock (of fetus) ; maintains (constant) temperature (of fetus) ; allows movement (of fetus) ; prevents dehydration ; AVP ;	max [2]	
		[Total: 14]	

Question	E answers	Mark	Additional Guidance
2 **(a)**	unsegmented **;** **A** no segments soft bodies **;** (muscular) foot **;** **ignore** feet mantle **;** visceral mass **;** AVP **;**	[max 2]	**ignore** no (exo)skeleton no backbone no bones radula bilaterally symmetrical shell / exoskeleton
(b)	(8) legs / tentacles / arms / limbs / **;** (large) eye **;** has a head **;** no shell / (completely) soft body / no exoskeleton / no external skeleton **;** suckers (on tentacles) **;**	[max 2]	**R** any internal features (see the question) **R** feelers / hands **ignore** no (muscular) foot / feet **A** suction pads
(c)	*look for an adaptation for attachment and an adaptation for survival when exposed to air* *allow ecf from part* **(a)** *attachment* threads / (muscular) foot / sticky fluid **;** *survival in the air* *either* shell / exoskeleton, prevents / reduces, water loss / *or* shell / exoskeleton, protects against (named) predator(s) **;**	[max 2]	**A** any suitable description of the threads e.g. fibres, projections, extension tentacles, etc. **R** suckers **A** slime / mucus for sticky fluid **ignore** protection unqualified **ignore** anything to do with gas exchange **ignore** camouflage if named must **not** be an aquatic predator

Question	E answers	Mark	Additional Guidance
2 (d) 1 2 3 4 5 6 7	has no, competitor(s) / predators (therefore increase in numbers) ; has no, pathogens / parasites / disease-causing organism(s) ; competes with existing species for, food/nutrients/space/oxygen ; could be a, predator / consumer , of other species ; **A** feeds on (many) other species could introduce, disease / parasite, for native species cause migration of native species ; AVP ; e.g. reduces <u>biodiversity</u> causes <u>extinct</u>ion decrease in numbers, higher in food web / at higher trophic levels increase in predators of zebra mussels	[max 3]	
(e) 1 2 3 4 5 6	do not move about / stay in one place, so exposed to pollutant (continuously) ; pollutant, kills them / reduces their numbers / prevents them breeding ; so presence / absence, is a good indicator ; pollutant accumulates (in animal's body) ; pollutant, detectable when concentrations are low / no longer present ; AVP ; they are filter feeders do not need to know what the pollutant is (as would be the case for a chemical test) no need for lab facilities / no need for equipment / can be done in the field	[max 2]	**R** more accurate **ignore** easy to, see / collect ; quicker to do skills / training needed / cheaper

Question	E answers	Mark	Additional Guidance
2 **(f)**	*non-biodegradable plastics*		
1	swallowed / ingested / eaten / cannot be digested **;**		
2	caught around / trapped / entangled **;**		
3	choke / blocks gut / smother / suffocate / injure / cut / trap / stuck in / AW **;**		**ignore** kills / dies unqualified
4	plastic blocks light for <u>photosynthesis</u> **;**		**A** organism is poisoned (by toxins)
5	may, contain / release, (oil-soluble) toxins / poisons **;**		**R** 'plastics are toxic'
6	large pieces of plastic may block flow of water (in a river) **;**		**A** suffocate in **MP3** as a consequence of **MP4**
7	that reduce concentration of dissolved oxygen **;**		**MP6** and **MP7** are linked
8	effect of loss of organism at a trophic level **;**		
9	AVP **;** e.g. any other consequence for organisms	[max 3]	

Question		E Answers	Marks	Additional Guidance
3	(a)	*Lilium* ;	1	
	(b)	**A** stigma ; **B** anther ; **C** petal ; **D** style ;	4	
	(c)	parallel veins / AW ; narrow / AW, leaves ; flower parts in, 3s / 6s ;	max 2	**A** non-branching veins / no mid-rib **A** long and thin **A** for any named part **R** one cotyledon
	(d)			

one mark per box – ignore any neutral comments

type of reproduction in flowering plants	advantages	disadvantages
asexual	only one, parent / plant ; fast ; (potential) rapid spread ; less energy required / no gametes needed ; if parent well adapted, offspring will be adapted to surroundings ; **max 1**	competition ; little / no, variation ; less evolution / less able to adapt to change ; may all be killed by same disease ; converse of MP5 for asexual ; **max 1**
sexual	variation ; evolution / formation of new species ; (seed) dispersal ; colonization / able to adapt to change ; **max 1**	may need two plants / pollinating agent; slow ; much pollen / many seeds wasted ; fertilization may not happen; loss of lots of energy ; **max 1**

			[Total: 11]

<table>
<tr><th colspan="3">Question</th><th>E Answers</th><th>Marks</th><th>Additional Guidance</th></tr>
<tr><td>4</td><td colspan="2">(a)</td><td>wings ;
beak ;
feathers / plumage ;
scales on, legs / feet ;</td><td>[3]</td><td>ignore adjectives such as grey / long / sharp</td></tr>
<tr><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>quantitative (feature) ;
range between two extremes ;
ref. to (many) intermediates ;
not in distinct groups ;
influenced by the environment (and genotype) ;</td><td>[2]</td><td>A answer in context of wing length</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>(ii)</td><td>length of …… anything suitable

(body) mass ;
age ;</td><td>[max 1]</td><td>A height R any discontinuous variable, e.g. colour
A weight R size / size of …..
A height</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td></td><td>(c)</td><td>(i)
1
2

3

4

R ‘greater life expectancy’</td><td>largest number of / most, birds trapped ;
oldest (mean age for) birds trapped ;

comparative data quote for numbers ;
accept fraction / percentage / proportion of total

comparative data quote for age ;</td><td>[max 4]</td><td>assume answer is about birds trapped unless stated otherwise

<table>
<tr><th>wing length at ringing / mm</th><th>number of birds trapped</th><th>mean age at trapping / days</th></tr>
<tr><td>less than 63</td><td>24</td><td>253</td></tr>
<tr><td>64</td><td>72</td><td>256</td></tr>
<tr><td>65</td><td>1</td><td>297</td></tr>
<tr><td>66</td><td>1</td><td>346</td></tr>
<tr><td>67</td><td>1</td><td>349</td></tr>
<tr><td>68</td><td>1</td><td>270</td></tr>
<tr><td>69</td><td>66</td><td>237</td></tr>
<tr><td>more than 70</td><td>23</td><td>199</td></tr>
<tr><td></td><td>total = 771</td><td></td></tr>
</table></td></tr>
</table>

Question			E	Answers	Marks	Additional Guidance
4		(ii)	1 2 3 4 5 6 7 8 9 10 11 12	number of young birds of each wing length ; wing lengths of birds that died ; length of life / length of life after trapping ; results for birds in West Africa ; effects of migration ; wing lengths of birds that breed ; number of times each bird is trapped ; effect of trapping on behaviour ; larger sample ; other locations in, Sweden / anywhere in Europe ; AVP ; AVP ;	[max 3]	*look for types of evidence, not assertions* **R** wing length of newly hatched birds **R** 'study should be repeated' e.g. number of eggs laid by birds of each wing length / te which birds fly furthest / test which birds best at catching food
	(d)		birds with wing length 66–67, survive / live longer ; breed / reproduce / have offspring ; pass on their allele(s) for wing length ; birds with smaller and larger wings, die ; do not reproduce (as successfully) ;	[max 4]	**A** gene(s) *wing length may be implied* **A** 'the others'
				[Total: 17]		