18. Classification, Biodiversity and Conservation

18.3 Conservation

Paper 4

Marking Scheme

Q1.

(a)	*any **four** from:* 1 not predated / predators killed (as toxic) ; 2 eats / decreases numbers, of, native / local, species ; 3 disrupts, food web / food chain / ecosystem ; 4 can spread to other areas / numbers increase rapidly ; 5 reduces biodiversity ; 6 can cause extinction (in, native / local, species) ; 7 competes (with native species) for, space / breeding areas / food / water / resources ; 8 introduces / new, disease ;	**4**

(b)	***A** eggs for ova / oocytes* *any **four** from:* 1 (females) given, hormones / FSH, to stimulate maturation of, ova / oocytes **or** (females) given, hormones / FSH, to stimulate superovulation ; 2 ova / oocyte, collection / harvesting ; 3 sperm added to, ova / oocytes **or** *ref. to* fertilisation ; 4 sperm from genetically distant male / AW ; 5 embryos, checked / selected ; 6 embryo placed into uterus ; 7 some embryos can be frozen ;	**4**

Q2.

(a)	*any **three** from:* **1** assess / categorise / rank, species, threat level / conservation status ; **2** *ref. to* Red List (of Threatened Species) **3** influence / advise, countries / governments / policy makers ; **4** educate / raise awareness ; **5** promote sustainable, use / management, of (natural) resources ;	**3**

Q3.

(a)	*any **three** from:* 1 loss of habitat / example ; 2 hunted / poaching / increased predation ; 3 climate change / example ; 4 competition for, food / resources / example ; 5 **new** disease ; 6 illegal pet / fur, trade ;	**3**

(b)	1 large / steep, increase from 1980 to 1990 ; 2 plateau / remains constant **or** slight changes / fluctuates ; 3 data quote (two numbers and two years) ;	**3**

year	number of lemurs born
1970	5
1980	32 / 33
1990	175
2000	175
2010	184 / 185
2020	170

(c)(i)	*any **three** from:* 1 stress (in captivity) ; 2 reproductive cycle disrupted ; 3 may reject mate / refuse to breed / do not have correct (courtship) behaviour ; 4 lack of suitable mates ; 5 enclosure too small / not natural environment ; 6 expensive ; 7 AVP ; e.g. inbreeding	**3**

(c)(ii)	increase / maintain, **genetic** diversity / heterozygosity / hybrid vigour / gene pool **OR** reduce, inbreeding depression / homozygosity ;	**1**

Q4.

(a)	*any **three** from:* 1 safe location **or** protected from, predators / hunters / poachers ; 2 research qualified ; e.g. disease control / into diet / behaviour 3 raise funds ; 4 work with local, communities / governments or conservation projects ; 5 education / raise awareness ; 6 medical / veterinary / health, (care) ;	**3**
(b)	*any **four** from:* 1 unnatural environment / described ; **ora** 2 effect of captivity on fertility ; 3 refuses to mate ; 4 low availability of suitable mates / AW ; **ora** 5 stress / pressure ; 6 AVP ; e.g. zoo capacity / zoos control number they breed	**4**
(c)	**A** – fertilisation occurs / sperm or semen added ; **B** and **C** – surrogacy / described ; cryopreservation / described ;	**3**

Q5.

(d)	*any **four** from:* **1** rats no longer, prey on / eat, birds / eggs / chicks ; **2** mussels / sea snails, decrease because there are more (named) birds ; **3** seaweeds increase because there are fewer, mussels / (sea) snails ; **4** Hawadax has changed to match a rat-free island ; **5** rats were an, invasive / alien, species / predator ; **6** AVP ;	**4**

Q6.

(b)	*any **four** from:* 1 *idea of* negative impact on, the environment / ecosystems / habitat / food webs / food chain ; 2 decreases biodiversity ; 3 large / fast, increase in number ; 4 competition for (named) resources ; 5 *ref. to* new disease ; 6 may be toxic **or** few animals able to eat it ; 7 attracts pollinators (away from native species) ;	**4**

Q7.

(d)(ii)	low(er) genetic variation means high(er), conservation status / threat / vulnerability / endangerment / risk of extinction ;	**1**
(d)(iii)	*any **three** from:* *does **not** support because* 1 chimpanzee has, most / highest, genetic variation but is, EN / endangered ; 2 minke whale has (joint), least / lowest, genetic variation but is, LC / least concern ; 3 genetic variation, similar / same, but conservation status is different ; 4 example ; 5 gorilla is, most / critically, endangered but has high(er) genetic variation ; 6 AVP ; e.g. *ref. to* data limited to only seven species	**3**

Q8.

(a)	*any **two** from:* 1 habitat loss ; 2 competition with / disease from, farm / invasive / alien, animals / species ; 3 climate change ; 4 hunting / poaching / killing by humans ; 5 AVP ;	**2**
(b)	*any **three** from:* 1 global / international / worldwide (authority / advisory) ; 2 (to give advice to) conserve / protect, nature / biodiversity / habitats ; 3 assess / categorise, species conservation status ; 4 ref. Red List (of Threatened Species) ; 5 influence, governments / policy ; 6 educate / raise awareness ; 7 AVP ;	**3**

(c)	*any **four** from:* 1 mating / IVF / (super-ovulate female plus) AI ; 2 remove embryo (from, mated / artificially inseminated, female) ; 3 check / select, healthy / normal / best, embryos ; 4 may freeze embryos for, storage / later use ; 5 implant embryos in (different female) uterus ; 6 ref. surrogate (mother) ; 7 ref. (named female reproductive) hormone(s) ; 8 AVP ;	**4**

Q9.

(a)(i)	*any **three** from:* **1** habitat loss ; **2** for, agriculture / building / roads / forestry / mines / development ; **3** hunting / fishing ; **4** collecting plants ; **5** humans aid spread of (animal / plant) disease ; **6** humans aid spread of, alien / invasive / competing, species ; **7** (named) pollution / pesticides ;	**3**

(b)	*any **seven** from:* **1** (named) food ; **2** (named) medicines ; **3** wood / fibres / paper / rubber ; **4** genetic diversity for future use ; **5** science / technology / research ; **6** education ; **7** aesthetic / wellbeing ; **8** (eco)tourism / attract visitors ; **9** ethical / moral / stewardship ; **10** local cultural significance ; **11** maintain / protect / stability of, food chains / food webs ; **12** pollination / ecosystem services ; **13** protect against, soil erosion / coastal erosion / flooding ; **14** soil formation ; **15** (named) mineral, cycles / recycling **OR** *ref. to* stage in cycle of named element ; **16** climate stability ;	**7**

Q10.

(b)	*any **three** from:* 1 loss of habitat / example ; 2 climate change ; 3 predation ; 4 competition for, food / resources / breeding sites / example ; 5 new disease ; 6 pollution / example ; 7 numbers get so low that population can't recover / AW ;	**3**
(c)	13 000 / 1.3×10^4 ;	**1**

Q11.

(a)(iii)	*any **two** from:* **1** (**yes** because as number of species has increased) biodiversity has increased ; **2** (*idea of* **no** because) numbers of new species that are being discovered are greater than the numbers of species becoming extinct ; **3** (*idea of* **no** because) does not assess number of individuals in a species ; **4** AVP ; e.g. some species only exist in captivity	**2**

(b)(i)	*any **two** from:* **1** habitat loss / habitat fragmentation / urbanisation / building / deforestation ; **2** insecticides / pesticides / farming / agriculture / fertilizers ; **I** pollution **3** new / increase in, predators / diseases / parasites ; **4** food shortage / increased competition (for food) ;	**2**

(b)(ii)	*any **two** from:* **1** Bt toxin (only) kills, specific insects / insects that feed on the crops ; **2** reduces use of, insecticides / pesticides ; **3** *idea that* insects survive to pollinate plants ;	**2**

Q12.

(d)	*any **two** from:* 1 habitat loss ; 2 more competition for, space / mates ; 3 reduction in prey ; 4 poaching / hunting / poisoning (by humans) ; 5 disease ;	**2**

Q13.

(b)	*any **four** from:* 1 climate change / end of (last) ice age / (global / local) warming ; 2 arctic fox, species / population, not well-adapted / unable to adapt ; 3 hunting, removed / caused extinction of, lynx / large predators ; 4 introduction of, named / alien / invasive / domestic, species / animal ; 5 may, eat / compete with / spread disease to, native, species / animal ; 6 overgrazing problem explained ; 7 may, change / destroy / disrupt, habitats / food webs ; 8 AVP ;	**4**

(c)	*any **five** from:* 1 obtain, healthy / fertile / wild-caught / captive bred, (founder) animals ; 2 *ref. to* genetic, variation / diversity / testing ; 3 (consider if), sufficient / suitable, habitat / area, available ; 4 (consider if) sufficient, prey / food, available ; 5 public safety advice / education ; 6 (organise) compensation for farmers who lose livestock ; 7 outlaw, killing / disturbing, lynx ; 8 (plan to) monitor, lynx / other animal / prey, populations ; 9 (plan to) cull / control / use contraceptives, if population, grows too much / spreads too far ; 10 AVP ;	**5**

Q14.

(c)	*any **two** from:* **1** identify species, quickly / automatically / by non-experts ; **2** compare with, Red List / IUCN list / CITES appendix ; **3** confiscate / destroy / relocate, endangered species / ES products ; **4** prosecute / stop activities of, smugglers / traders / poachers ; **5** prevent entry of, predators / competitors / diseases, that could harm native ES ;	**2**

Q15.

(a)	5000 ÷ 350 ; 14.3 ;	**2**
(b)	*any **five** from:* **1** aesthetic / leisure, reasons ; **2** moral / ethical, reasons ; **3** resource material ; **4** economic benefits for local community / (eco)tourism ; **5** maintain / do not disrupt, food webs / food chains / ecosystem ; **6** mineral (re)cycling ; **7** maintain, large gene pool / genetic variation ; **8** AVP ;	**5**
(c)	*any **two** from:* **1** do not buy unsustainable palm oil (products) ; **2** campaign / raise awareness / educate, for sustainable palm oil ; **3** donate to, anti-deforestation / conservation, charities ; **4** AVP ;	**2**

Q16.

(a)	*any 3 of:* 1 killed by humans ; 2 difficulty in finding a mate ; 3 loss of habitat / habitat fragmentation / habitat polluted / deforestation ; 4 food shortage ; 5 (new) diseases ;	**3**
(b)	*any 3 of:* 1 maintains or increases, gene pool / genetic diversity / genetic variation ; 2 maintains or increases, heterozygosity ; 3 hybrid vigour ; 4 reduces / prevents, inbreeding depression ; 5 reduce chances of harmful recessive alleles coming together ;	**3**
(c)	*any 2 of:* 1 IVF or description; 2 embryo transfer ; 3 surrogacy or description ; 4 artificial insemination ;	**2**

Q17.

(a)(i)	*any one from:* positive correlation ; as area (of forest) increases, number / population / orangutans, increase(s) ; **ora**	**1**
(a)(ii)	25 000 – 7300 2016–1985 ; 571 (per year) ;	**2**
(a)(iii)	12.78 / 12.8 / 13 (years) ;	**1**
(b)	*any two from:* 1 hunting / poaching, for, bushmeat / (traditional) medicine / crop protection ; 2 hunting / (live) capture, for pets / trade ; 3 disease ; 4 breeding problems due to, individuals isolated / mates inaccessible / inbreeding in small populations ;	**2**
(c)	*any three from:* 1 breeding (programmes) ; 2 release / reintroduction (to, wild / Sumatra/ reserves) ; 3 educate / raise public awareness ; 4 research, diet / breeding / behaviour / genetic diversity ; 5 raise money for, reserves / protecting wild population ; 6 AVP ; e.g. cooperate with governments	**3**

Q18.

(a)(i)	*any three from* **1** habitat destruction ; **2** competition for food / food shortage ; **3** predation / predators ; **4** disease / infection ; **5** AVP ; e.g. pollution / pesticide use / removed from wild (to zoos) to conserve species / problems finding a mate	**3**
(a)(ii)	*any two from* **1** (captive) breeding ; **2** release into wild / insurance populations ; **3** education / increase awareness (of illegal bird trade) ; **4** research, diet / habitat / breeding / behaviour / genetic diversity ; **5** raise money / work with (Bali) government, to set up reserves ; **6** veterinary / health, care ;	**2**