Unit 28 · Animal Behavior

ANSWER KEY · FOR TEACHERS

Full marks 35

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. ethology
2. innate
3. habituation
4. imprinting
5. kinesis
6. menotaxis
7. hierarchy
8. anadromous

K · 4

Each carries 0.5 mark.

2 Label the diagram

1. dorsal root ganglion
2. effector (muscle)
3. sensory neuron
4. receptor in the skin
5. motor neuron
6. interneuron

K · 3

Each carries 0.5 mark.

3 Multiple choice

i. **c.** menotaxis — K · 1

In **menotaxis** an animal keeps a fixed angle to the light, using it like a compass.

ii. **c.** altitudinal — K · 1

Moving **up and down** a mountain with the seasons is **altitudinal** migration.

iii. **c.** learned behavior (conditioning) — U · 1

No cat is born knowing what a fridge door means. It has learned to link that sound with food: **conditioning**, a kind of **learned** behavior.

iv. **a.** in the dorsal root ganglion — U · 1

The sensory neuron's cell body sits in the **dorsal root ganglion**, outside the cord. The motor neuron's is in the **ventral horn** of the gray matter.

v. **b.** tropotaxis — A · 1

In **tropotaxis** the animal turns until its two eyes get equal light. With one eye covered they never can, so it keeps turning towards the working eye: the circus movement.

4 Very short answers

a. MARKING SCHEME — K · 1

✓ Schjelderup-Ebbe, in hens.

b. MARKING SCHEME — K · 1

✓ The matriarch (oldest female).

c. MARKING SCHEME — U · 1

✓ The reflex is handled by the spinal cord before the message reaches the brain.

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5 Short answers

a. MARKING SCHEME — U · 2

- ✓ Taxis: directional movement towards or away, e.g. a moth to a lamp.
- ✓ Kinesis: a change of speed or turning only, e.g. woodlice in damp air.

b. MARKING SCHEME — A · 2

- ✓ Positive rheotaxis.
- ✓ Any two: keeps them in place; brings food; brings oxygen.

c. MARKING SCHEME — U · 2

- ✓ Dominance: control over others for first use of resources, with an example.
- ✓ Leadership: guiding the group's activities, with an example.

d. MARKING SCHEME — U · 3

- ✓ Protects the body by a fast response.
- ✓ Saves the brain work; keeps routine processes going.
- ✓ One correct spinal and one cranial reflex.

6 Long answers

a. ANSWER — U · 4

Advantages:

a. Protection from harsh weather and the shortage of food it brings.
b. Good breeding grounds, with long days and plenty of food for the young.
c. Less overcrowding, and new or untouched places to feed.
d. A better chance of survival for the young, away from many predators.

Disadvantages:

a. Exhaustion: some birds fall into the sea, rivers, forests or onto rocks and die.
b. Many natural enemies on the way.
c. Storms, heavy rain, snowfall and hurricanes kill many.
d. Parasites and diseases picked up, and carried, on the way.

MARKING SCHEME

- ✓ Advantages: escape from harsh weather and shortage of food; good breeding grounds.
- ✓ Less overcrowding, new places to feed; better survival of the young.
- ✓ Disadvantages: exhaustion and death on the way; enemies on the way.
- ✓ Storms and bad weather; parasites and diseases picked up and spread.

b. ANSWER — U · 4

Anadromous: from the sea up into fresh water to breed (salmon, hilsa). **Catadromous**: from fresh water down to the sea to breed (the eel *Anguilla bengalensis*). **Amphidromous**: between sea and fresh water both ways, not to breed (gobies). **Potamodromous**: only within fresh water (carps, golden mahseer). **Oceanodromous**: only within the sea (tuna, herring). Others: alimental, for food (sharks); shoreward (climbing perch); vertical, up at night and down by day (lanternfish); latitudinal, north and south (swordfish); climatic.

MARKING SCHEME

- ✓ Any one type, with its meaning and an example.
- ✓ A second.
- ✓ A third.
- ✓ A fourth.

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7 Think

ANSWER HA · 3

The hilsa is **anadromous**: it lives in the Bay of Bengal and must swim up the rivers to breed. **Barrages and dams** across the Ganga and its tributaries (such as the Farakka barrage, finished in 1975) **block its way upstream**, so it can no longer reach its breeding grounds in Nepal. **Fish passes (fish ladders)** in the barrages, or keeping some rivers free of dams, would let it through.

MARKING SCHEME

- ✓ The hilsa is anadromous: it must swim upriver from the sea to breed.
- ✓ Barrages and dams downstream block its way.
- ✓ A remedy, e.g. fish passes or ladders, or free-flowing rivers.

8 Activity: The knee jerk

(not marked)

WHAT STUDENTS SHOULD FIND

The lower leg kicks forward by itself; it is hard to stop; the kick is usually bigger when you pull on your fingers (the brain is distracted from holding it back). The receptors are the stretch receptors in the thigh muscle; the effector is the same thigh muscle. It is a **spinal** reflex: the spinal cord sends the impulse straight back to the muscle, with no part for the brain.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	11	18	3	3	**35**

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