

Sex & Behaviour Past Papers

1. Green sturgeon, *Acipenser medirostris*, are fish that can grow to be over 2 m long with a mass of 160 kg. Females can live to be 50 years old and begin spawning at around 16 years. They then spawn every 4–5 years, producing thousands of eggs per spawn. Compared to other sturgeon species, the number of eggs produced is relatively low due to their large egg-size.

From the information given, which is the best description of the green sturgeon's reproductive strategy?

- A r-selected only
- B K-selected only
- C Mainly r-selected, but with features of K-selection
- D Mainly K-selected, but with features of r-selection

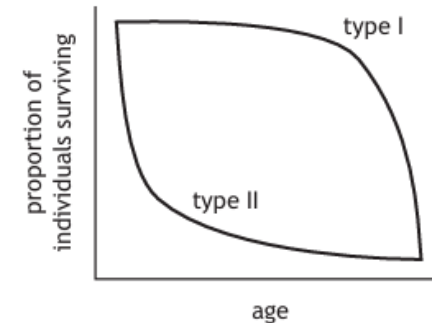
2. Which of the following statements about animal species that use external fertilisation is correct?

- A External fertilisation never involves courtship rituals.
- B Female choice is never a feature of external fertilisation.
- C External fertilisation requires the direct transfer of gametes.
- D Offspring produced by external fertilisation generally have lower survival rates.

3. Which of the following characteristics is most likely to be found in an r-selected species?

- A Produce a large number of small offspring
- B Most offspring reach adulthood
- C Have a longer generation time
- D High level of parental care

4. The survivorship curves show the probability of individuals in two types of species living to different ages.



Which row in the table shows the likely survivorship and environment of a K-selected species?

	Survivorship	Environment
A	type I	stable
B	type I	unstable
C	type II	stable
D	type II	unstable

5. The red-necked phalarope, *Phalaropus lobatus*, is a rare wading bird that breeds in parts of the British Isles during summer.

The females are larger than males and are more brightly coloured. When breeding, the females compete for males and take the lead in courtship. When egg-laying is complete, the female may search for another male. Male birds incubate the eggs and carry out all other parental tasks but each male breeds with only one female in a breeding season.

Which of the following are features of the red-necked phalarope's reproductive behaviour?

- A Polygamy and polygyny
- B Polygamy and polyandry
- C Monogamy and polygyny
- D Monogamy and polyandry

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6. Some populations of a species may evolve to become more r-selected or K-selected depending on the nature of the habitat they occupy.

Which row in the table shows changes in the factors likely to be associated with a population becoming more K-selected?

	Environmental stability	Number of offspring
A	increase	decrease
B	increase	increase
C	decrease	increase
D	decrease	decrease

7. In three-spined stickleback fish, males have a distinctive red underside in the breeding season, which is not present in females. Territorial males were presented with model fish, some of which had their undersides painted red and some of which were left unpainted. Males showed an automatic attack response to only the red-painted models.

This attack response behaviour is triggered by

- A sexual dimorphism
 - B sexual selection
 - C an honest signal
 - D a sign stimulus.
8. Many species display some characteristics that are typical of r-selection and some that are typical of K-selection.
- Which of the following species displays **only** K-selected characteristics?
- A Leatherback turtles: lay up to nine large clutches of eggs per breeding season; hatchlings receive no parental care; small proportion survives to reach sexual maturity.
 - B Arctic terns: usually lay two eggs per clutch; adults are aggressive in defence of their young; more than 50% of offspring live to 30 years of age.
 - C English oak trees: slow-growing; do not produce seeds until at least 40 years of age; mature trees produce many thousands of seeds annually but only a small proportion germinate.
 - D Common dandelions: readily colonise disturbed ground; grow rapidly; flower several times a year; produce many seeds per flower head.

9. During the ritualised courtship in peafowl, *Pavo muticus*, the male spreads and shakes his tail feathers to attract a female before stepping back and bowing. This is followed by loud mating calls.

This type of fixed action pattern response can be a result of

- A honest signals
 - B imprinting
 - C male-male rivalry
 - D species-specific sign stimuli.
- 10 The black grouse male is larger and more brightly coloured than the female and competes with other males at leks.

Which of the following pairs of features are characteristic of this species?

- A Monogamy and sexual dimorphism
 - B Monogamy and reversed sexual dimorphism
 - C Polygamy and sexual dimorphism
 - D Polygamy and reversed sexual dimorphism
11. Which row in the table best describes r-selected species?

	Number of offspring	Offspring survival rate	Parental care
A	many	low	little
B	few	high	extensive
C	many	high	extensive
D	few	low	little

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12. An organism's parental investment strategy can be classified as k-selected or r-selected.

Which row in the table below describes the characteristics of k-selected organisms compared to r-selected organisms?

	<i>number of offspring produced</i>	<i>size of offspring produced</i>
A	larger	larger
B	larger	smaller
C	smaller	larger
D	smaller	smaller

13. The black belly stripe of great tit males (*Parus major*) is an important stimulus in territorial and courtship displays. Males with broader stripes make better parents and are more attractive to prospective mates. The width of the stripe is therefore correlated with male quality.

This stripe functions as

- A an honest signal
- B a sign stimulus
- C a fixed action pattern
- D an imprinting stimulus.

14. Identify the line in the table that applies to r-selected species.

	<i>many offspring produced</i>	<i>prolonged parental care</i>
A	yes	yes
B	yes	no
C	no	yes
D	no	no

15. An organism's parental investment strategy can be classified as k-selected or r-selected.

Which line in the table correctly describes the characteristics of k-selected organisms compared to r-selected organisms?

	<i>Number of offspring produced</i>	<i>Size of offspring produced</i>
A	larger	larger
B	larger	smaller
C	smaller	larger
D	smaller	smaller

16. In some species of bird the females are larger than the males. This is described as

- A lekking
- B reversed sexual dimorphism
- C sexual dimorphism
- D female choice.

17. Which line in the table correctly describes imprinting?

	<i>Within critical period</i>	<i>Reversible</i>	<i>Learning process</i>
A	Yes	No	Rapid
B	No	Yes	Slow
C	No	No	Rapid
D	Yes	Yes	Slow

Sex & Behaviour Past Paper Answers

1. D
2. D
3. A
4. A
5. B
6. A
7. D
8. B
9. D
10. C
11. A
12. C
13. A
14. B
15. C
16. B
17. A