

Let us Practice

Exercise I

- Which one of the following statements is a scientifically meaningful explanation of circadian rhythm?
 - The behaviour of an organism is conditioned by internal physiological readiness and capacities of various sorts but it does not fluctuate rhythmically in response to external stimuli
 - The behaviour of an organism in its natural environment is a response to external stimuli alone and fluctuates rhythmically
 - The behaviour of an organism in its natural environment is response to external stimuli and is conditioned by internal physiological readiness and capacities of various sorts. Both external environment and internal readiness fluctuate rhythmically and at specific interval
 - The behaviour of an organism in its natural environment is a response to external stimuli and is conditioned by internal physiological readiness and capacities of various sorts. But the external environment and internal readiness fail to fluctuate rhythmically at intervals
- Courtship displays are used by animals to
 - warn of intruders and approaching enemies
 - assist in attracting a mating partner
 - indicate where stored food is hidden
 - communicate differences in status between animals of the same sex
 - show parental care and affection of offspring
- Bees communicate with each other about the location of food sources (flowers) by
 - using high pitched noises generated by beating their wings to give directions to others
 - secreting hormones in their hives to form a kind of a map for others to read
 - performing a dance in the hive to indicate the direction from the hive relative to the sun
 - forming grooves in the wax in the hive to form a kind of a map for others to read
 - orientating their chambers in the hive to indicate the direction from the hive relative to the sun
- Male stickleback fishes, which have slender red bellies, show different behavioural response to different objects as shown below :

Colour of Object	Shape of Object		
	Round	Square	Similar to Animal
Red belly	<input type="checkbox"/> #	<input type="checkbox"/>	<input type="checkbox"/>
Silver belly	#		

: aggressive behaviour for territory.
 # : courting

Make the correct interpretation of the tabulated observations. (2nd NSEB)

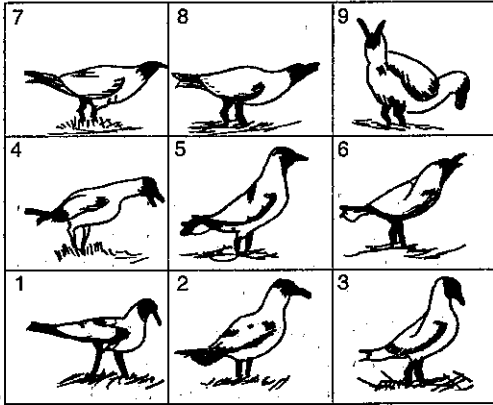
 - Specific shape acts as a stimulus for aggressive behaviour of stickleback
 - Major stimulus for courting behaviour is specific colour pattern
 - Red and silver colours are most important stimuli for courting response
 - Colour pattern is more important than shape in aggressive response
- Ants when dead, get decomposed. Among the various products of decomposition, a few fatty acids and their esters activate the funeral response. Triggered by these molecules, other ants bring these corpses outside the nest. If these chemicals are deposited on the live ants in the nest (2nd NSEB)
 - ants with the chemicals will be killed by the other ants and brought out of the nest
 - they will not be touched by the other ants
 - they will be brought out by the other ants
 - ants with chemicals will become immobilized and then brought out by the other ants

6. Imprinting is
- an irreversible form of behaviour that is learned
 - a behaviour that is remembered for as long as the behaviour is reinforced
 - exhibited in all animals
 - learnt after a critical period during the development of an animal
7. Sinking of zooplankton during the day and rising to the surface at night, is an example of (1st NSEB)
- circinal rhythm
 - circadian rhythm
 - tidal rhythm
 - None of the above

Exercise II

1. Which one of the four statements given below is false?
- Certain innate patterns of behaviour can be modified by experience
 - Taxes never occurs together with fixed action patterns
 - A super normal stimulus often produces a stronger response
 - Fixed action patterns are highly stereotyped instinctive behaviours
2. The complexity of the behavioural response increases with the complexity of the nervous system. The correct trend of different behaviours in animal kingdom is (2nd INBO)
- Instinct → Taxes → Learning → Reasoning
 - Taxes → Reflex → Learning → Reasoning
 - Instinct → Taxes → Reasoning → Learning
 - Reflex → Taxes → Reasoning → Learning
3. Animal behaviour patterns, in which an individual endangers its life to benefit other members of the group, are called altruistic. It is believed that altruistic behaviour was favoured by Kin selection. Which of the example given below can not be explained as Kin-selection-favoured?
- Suicidal attack by a worker bee guarding its hive
 - Protection of the queen of an ant species by 'soldier ants'
 - Protection of the lion cubs by a lioness not being their mother
 - Warning cries of a bird warning other individuals about approaching danger
4. Altruistic behaviour among animals is one where an individual endangers life to benefit other members of the group. This type of behaviour is favoured by Kin selection. One of the instances gives does not explain this altruistic behaviour
- Mass suicidal death of worker bees guarding their hive
 - Protection and food given to queen ant by its soldier ants
 - Shrill cries of birds warning other individuals about the approaching danger
 - A sick mother dog allowing her puppies to suck her milk
5. Animals show different behaviours such as feeding, mating, caring of young, etc. Evolution of a particular type of behaviour in an animal ultimately leads to (2nd INBO)
- survival of its species
 - survival of its own genes
 - survival of those species that co-exist and mutually help
 - All of the above
6. In situation that conflict between attack and flight animals have been noted to behave in a most peculiar fashion, e.g., the behaviour of fighting cocks interrupting their fight to peck at the ground for food. What is this kind behaviour called?
- Feeding
 - Ritualization
 - Displacement activity
 - Aggressive behaviour
7. What is this behaviour (see former question) based on?
- Lack of food or hunger
 - Lateral inhibition of two opposing behaviour tendencies
 - Irritation of a nerve
 - Displacement of an initial stimulus from one nerve to another

8. The figure shows possible positions of the black headed gull (*Larus melanocephalus*). A gull has landed by accident in the territory of another gull and both gulls meet each other. Which position will probably be shown by the visitor gull?



- (a) Position 1
 (b) Position 3
 (c) Position 5
 (d) Position 7
 (e) Position 9

9. Humming birds living at high altitudes enter a stage of inactivity with sunset. This is due to
 (a) morphological response
 (b) ultimate causation
 (c) endothermic reaction
 (d) physiological response

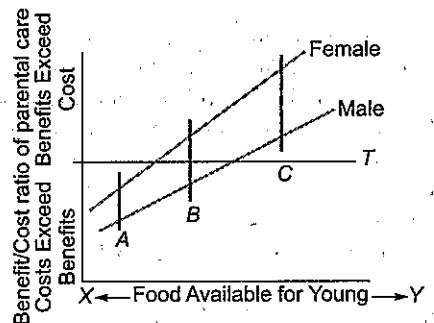
10. Here is an example of a process by which birds process information: Ravens, a type of crows, were exposed to food attached to a piece of string. Mark the correct behaviour of the bird at getting food.
 (a) There is individual variation in retrieving food
 (b) Some never learn to get at the food.
 (c) Some solved the problem by using both feet
 (d) All of the above

11. A number of social factors influence the reproductive physiology and behaviour of house mice. Some social conditions and responses have been enlisted in the table below. Match each social condition with the corresponding response and fill in the response number in the table in the answer sheet.

Social Condition	Response
A. Juvenile females held with a dominant male.	1. Females begin estrous cycling.
B. Adult females held in a group without a male.	2. Females resorb embryos or abort spontaneously.
C. A dominant male added to a group containing only adult females.	3. The male's sexual activity falls.
D. Pregnant females exposed to the urine of a strange male.	4. The sexual maturation of females occurs rapidly.
E. An adult male exposed to a strange female.	5. Females stop estrous cycling.
F. An adult male exposed to the urine of pregnant or lactating mates.	6. The male's testosterone levels and sexual activity rise.

Social Condition	Response
A	
B	
C	
D	
E	
F	

12. Parental care in animals may be promoted by certain ecological factors. The possibility of parental care by the two sexes of a certain species in response to food availability is shown in the following figure.



- A. The availability of food for the young is related to parental care under the following conditions :
 (Put a tick mark (✓) in the appropriate box)
 (a) X-Low, Y-Abundant
 (b) X-Abundant, Y-Low
 (c) X and Y both low
 (d) X and Y both abundant

(a)	
(b)	
(c)	
(d)	

B. The line labelled *T* is the threshold above which (Put a tick mark (✓) in the appropriate box)

- (a) parental care will evolve
 (b) parental care will be abolished

(a)	
(b)	

C. At the point marked *A*

- (Put a tick mark (✓) in the appropriate box)
 (a) only females will exhibit parental care
 (b) only males will exhibit parental care
 (c) neither of the sexes will exhibit parental care
 (d) both the sexes will exhibit parental care

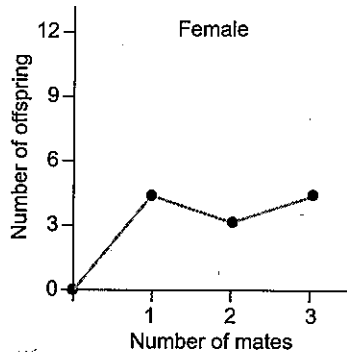
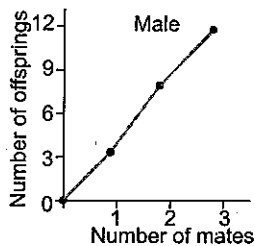
(a)	
(b)	
(c)	
(d)	

D. At the point marked *B*

- (Put a tick mark (✓) in the appropriate box)
 (a) males gain by being parental but females do not
 (b) females gain by being parental but males do not
 (c) Both sexes gain by being parental

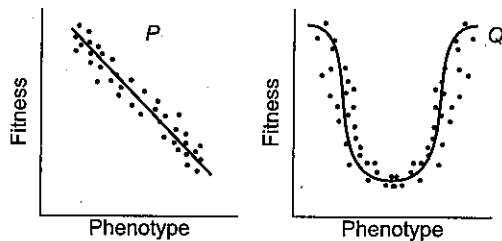
(a)	
(b)	
(c)	

13. The average reproductive success of an adult male *Drosophila melanogaster* kept with a varying number of females and of an adult female kept with a varying number of males is shown in the figure below.



Which of the following statements is true?

- (a) The reproductive success of both the sexes is limited by the number of mates available
 (b) The reproductive success of both the sexes is uninfluenced by the number of mates available
 (c) The reproductive success of males is limited by the number of available females
 (d) The reproductive success of females is limited by the number of available males
14. The fitness of individuals with different phenotypes of the same trait differs in two different situations *P* and *Q*. *P* and *Q* respectively indicate



- (a) disruptive and directional selection
 (b) directional and stabilizing selection
 (c) directional and disruptive selection
 (d) stabilizing and disruptive selection

Answers

Exercise I

1. (d) 2. (b) 3. (c) 4. (d) 5. (b) 6. (a) 7. (b)

Exercise II

1. (b) 2. (b) 3. (d) 4. (a) 5. (a) 6. (c) 7. (c) 8. (d)
9. (d) 10. (d)

Explanations

11.

Social condition	Response
A	4
B	5
C	10 or 6
D	2
E	6 or 1 or 4
F	3

12. A (b), B (a), C (c), D (b)

13. (c)

14. (c)