

ZOO403 – ANIMAL BEHAVIOR

FINAL TERM MOST IMPORTANT QUESTIONS

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1. Explain waggle dance.

In 1973, Karl von Frisch was awarded the Nobel Prize for his research on the honey bee waggle dance. He and his students carried out decades of research in which they carefully described the different components of each dance.

Their experiments typically used glass-walled observation hives and paint-marked bee foragers. First, they trained the foragers to find food at sources placed at known distances from the colony. When the bees returned from gathering food from those sources, they carefully measured both the duration and angle of the dances the foragers performed to recruit other bees to help gather food. Their findings led them to the concept of a dance language.

When a food source is very close to the hive (less than 50 meters), a forager performs a round dance. A round dance, communicates distance ("close to the hive," but not direction. Food sources that are at intermediate distances, between 50 and 150 meters from the hive, are described by the sickle dance. This dance is crescent-shaped and represents a transitional dance between the round dance and a waggle dance. The waggle dance or wag-tail dance, is performed by bees foraging at food sources that are more than 150 meters from the hive. This dance, communicates both distance and direction. While running the straight-line course of the dance, the bee's body, especially the abdomen, wags vigorously from side to side. This vibration of the body produces a tail-wagging motion. At the same time, the bee emits a buzzing sound, produced by wing beats at a low audio frequency of 250 to 300 hertz or cycles per second.

2. What is social organization?

Social organization is a pattern of relationships between and among individuals and social groups. Sociality is one of the most striking features in the Animal Kingdom. A large number of animal species, including humans, are social. A social organization is a large group of members who intercommunicate extensively, exhibit division of labor, and bear some relatively permanent social relationship to one another. Such organization exists in both invertebrates and vertebrates. Arthropods such as ants, bees and termites are the best examples of the social organization.

3. Define competition.

Competition is the struggle among organisms to survive in a habitat with limited resources (Species searching for the same kinds of food). Competition happens when organisms in an ecosystem have similar needs. Organisms with different needs can live and survive together in a habitat with little competition. Competition increases when the amount of available resources is low. Members of the same species compete for available resources. All organisms compete for resources (not just animals).

4. What are social animals?

Animals which build up social organizations among them are called social animals. They are:

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|-----------------------------|---|
| i. Ants and termites | v. Wolves |
| ii. Bees and wasps | vi. Lions |
| iii. Many species of birds' | vii. Monkeys and some species of Gorillas |
| iv. Wilder beasts' | viii. Humans |

5. What are types of mating system?

A mating system describes how males and females pair when choosing a mate. Males and females differ greatly in the investment each makes to reproduce, and may therefore approach mating with differing strategies. Common mating systems include monogamy, polygyny, polygamy and polygynandry. More specific descriptors of mating systems have been developed that account for pair bond duration, resource use and defense and behavior such as parental care.

6. Explain navigation or migration.

Animal migration is the relatively long-distance movement of individual animals, usually on a seasonal basis. It is the most common form of migration in ecology. It is found in all major animal groups, including birds, mammals, fish, reptiles, amphibians, insects, and crustaceans. In other words, Migration is the seasonal movement of animals from one habitat to another in search of food, better conditions, or reproductive needs.

7. Explain social organization in verve Monkeys.

Verve monkeys produce a complex set of alarm calls. They give distinct alarm calls for Predators like leopards, eagles or snakes. Alarm call for leopard is a loud barking sound. For an Eagle a short double-syllabled cough. For a snake, a "chutter". Upon hearing an alarm call, other verves behave in an appropriate way. Run up a tree on hearing alarm call for leopard, Look up on hearing alarm for an eagle, Look down on hearing alarm for a snake. Infant verves give and understand alarm calls, but in a relatively indiscriminating way. They give "eagle alarm" on seeing any bird. With age, they fine-tune their calls by learning from other members of the group.

8. Differentiate between intersexual and intrasexual selection.

INTERSEXUAL SELECTION:

Intersexual selection involves mate choice. In this selection, members of one sex choose mates on the basis of particular characteristics of other sex, such as appearance, color or courtship songs. Intersexual selection has led to sexual dimorphism in secondary sexual characteristics, such as the ornate plumage of birds, or the antlers of deer, or the manes of lions. Such selective characters correlate in general with the mate's health and vitality.

INTRASEXUAL SELECTION:

Intrasexual selection involves competition between members of the same sex for access to members of the opposite sex. Intrasexual selection usually occurs between males and may take the form of male-to-male combat or fight. Such species or individuals have developed better weapons for competition e.g. horns, antlers etc.

9. What are advantages of territorial behavior?

- i- Territorial behavior forms an important part of social behavior.
- ii- Territory provides a base which the male can advertise himself to female, and attract the female.
- iii- Provides a protected place for courtship, mating and parental care to young.
- iv- Provided safety where young can live freely and without any interference.

10. What is difference between polygyny and polyandrous system?

Polygynous systems involve an exclusive relationship of one male with two or more females. Polygynous species are generally dimorphic, with males being showier and often larger than females.

In polyandrous systems, one female has an exclusive relationship with two or more males. Polyandrous species are also dimorphic with females generally more ornamented and larger than males.

11. Write salient features of territoriality.

Territoriality is a type of intraspecific or interspecific competition that results from the behavioral exclusion of others from a specific space that is defended as territory. This well-defined behavior is exhibited through songs and calls, intimidation behavior, attack and chase, and marking with scents.

12. Explain reciprocal altruism.

In evolutionary biology, reciprocal altruism is a behaviour whereby an organism acts in a manner that temporarily reduces its fitness while increasing another organism's fitness, with the expectation that the other organism will act in a similar manner at a later time.

13. What are reflex arc component?

A reflex action requires a reflex arc which consists of a sensory organ (receptor), a sensory nerve (afferent nerve), the spinal cord or brain, an intermediate motor or efferent nerve and a motor organ or effector.

14. Why organisms compete for?

Competition is the struggle among organisms (plants or animals) to survive in an ecosystem with limited resources. All organisms have basic needs: they need to get energy and water, they need to be able to reproduce, and they need enough space.

15. Differentiate between specialist and generalist species.

SPECIALIST SPECIES:

Specialist species are animals that require very unique resources. Often, these species have a very limited diet, or need a specific habitat condition to survive. Specialist species evolved to fit a very specific niche. Environmental disruptions like effects from climate change or habitat loss have a strong effect on specialists.

GENERALIST SPECIES:

Species that can live in many different types of environments, and have a varied diet are considered generalists. Generalists can eat a variety of foods. Thrive in a range of habitats. They have broad niches. They can thrive in rapidly changing environmental conditions.

16. What is aggressive behavior?

Aggression is defined as threats or harmful actions directed toward another individual and can include threat displays, lunging, growling, snarling, snapping, and biting. "In animals, aggressive behaviors are a means of communication."

17. Which points should be kept in mind while selecting habitat?

When selecting a habitat, several factors should be considered to ensure the well-being and survival of organisms. These factors vary across different species, but common considerations include:

- 1. Food Availability:** The habitat should provide an adequate and appropriate food source for the organism. Different species have specific dietary requirements, and the availability of suitable food is crucial.
- 2. Water Source:** Access to clean and sufficient water is essential for most organisms. Habitats near freshwater bodies, such as rivers, lakes, or ponds, are often preferred.
- 3. Shelter and Nesting Sites:** The habitat should offer suitable shelter and nesting sites for protection against predators and environmental conditions. This may include vegetation, burrows, or specific structures.

4. Climate and Temperature: The climate and temperature of the habitat should match the species' physiological requirements. Some organisms thrive in hot and arid conditions, while others prefer cooler or more humid environments.

5. Oxygen Levels: Adequate oxygen levels are crucial for many aquatic organisms. Terrestrial organisms also need sufficient air for respiration.

6. Mate Availability: For species that reproduce sexually, the habitat should support the presence of potential mates to facilitate successful reproduction.

7. Predator-Prey Dynamics: The balance of predator and prey species in the habitat is important for maintaining ecological stability. Overpopulation of predators or prey can disrupt the ecosystem.

8. Social Structure: Some species have specific social structures and hierarchies. The habitat should support the social interactions and behaviors required for the well-being of these species.

9. Migration Routes: For migratory species, the habitat should be located along their migration routes, providing suitable stopover sites and resources during their journey.

10. Compatibility with Other Species: Consideration of the interactions with other species in the habitat is crucial. Mutualistic relationships, competition for resources, and potential conflicts should be assessed.

11. Human Impact: Evaluate the impact of human activities on the habitat, including pollution, deforestation, urbanization, and other anthropogenic factors.

12. Adaptability: The ability of organisms to adapt to changes in the habitat over time is essential. Habitats that support adaptive behaviors and physiological changes contribute to long-term survival.

18. Explain parental care in birds.

Birds show maximum parental care. Most newly hatched birds cannot care for themselves. They require a large, continuous food supply. Catering the needs of young is difficult for a single parent. To enhance chances of viability of offspring, most birds form monogamous pairs. Male stays with its mate and helps her till offspring are able to fulfill their own needs. Lactating female nourishes the young. She provides most of the required care.

19. Write characteristics of social behavior.

Social behavior ranges from simple attraction between individuals to life in complex societies characterized by division of labor, cooperation, altruism, and a great many individuals aiding the reproduction of a relative few. The most widely recognized forms of social behavior, however, involve interaction within aggregations or groups of individuals. Social behaviors,

their adaptive value, and their underlying mechanisms are of primary interest to scientists in the fields of animal behavior, behavioral ecology, evolutionary psychology, and biological anthropology.

20. What is mono parental care and bi-parental care?

MONO PARENTAL CARE:

Mono parental care is a type of behavior in which one of the parent takes care of the young while one of them is engaged in hunting, security and other works.

BIPARENTAL CARE:

Biparental care is particularly prevalent in mammals and birds. 90% of bird species are monogamous, in which biparental care patterns are predominant. In birds, this parental care system is generally attributed to the ability of male birds to engage in most parental behaviors, with the exception of egg-laying.

21. What are three types of neuronal plasticity?

There are two main types of neuronal plasticity.

- Functional plasticity is the brain's movement to move functions from damaged area of the brain to other undamaged areas.
- Structural plasticity is the brain's ability to actually change its physical structure as a result of learning.

22. Explain web making process.

A spider web or cobweb (from the archaic word coppe, meaning "spider") is a structure created by a spider out of proteinaceous spider silk extruded from its spinnerets, generally meant to catch its prey. Spiders produce silk threads to build their webs. Silk is produced in silk glands with the help of the spider's spinnerets. Spinnerets are special organs that allow the spider to decide what type of thread it needs for the web. The silk threads can be thick or thin, dry or sticky, beaded or smooth. The threads a spider uses to construct its web begin as liquid, but they dry quickly in the air. Making webs is instinctive for spiders, which means nobody has to teach them how to do it. They are born knowing how.

Process of web making

- When a spider begins a web, it releases a silk thread. It anchors the thread to some object such as a branch.
- As the spider moves back and forth, it adds more threads, strengthening the web and creating a pattern.
- Lines that go from the center of the web outward are called "radial lines". They support the web.
- Threads that go around and around the web are called "orb lines."

23. Define habituation and its examples.

Habituation is the reduction of a behavioral response to a stimulus after repeated presentations of that stimulus (Rankin et al., 2009). Habituation can occur to stimuli detected by any of your senses. You may become habituated to loud sounds, bright lights, strong odors, or physical touch. There are two types of habituation: Long-term habituation and short-term habituation.

24. Enlist animals showing altruism.

Many animals show altruism. Some of them are: Elephant, octopus, Orangutans, Monkeys, Ants, Humpback whales, Chimpanzees, vampire bats, dolphins, fishes, birds, Wolves, lions, lemurs, mongooses, dogs, human e.t.c.

25. What are benefits of biological clocks?

- **Adaptation to Environmental Changes:** Enables organisms to anticipate and adjust to regular environmental cycles.
- **Optimized Metabolism:** Coordinates physiological processes for energy efficiency and metabolic optimization.
- **Enhanced Sleep-Wake Cycles:** Regulates sleep patterns for improved overall health and cognitive function.
- **Reproductive Timing:** Ensures reproduction occurs when environmental conditions are favorable for offspring survival.
- **Improved Cognitive Function:** Influences memory, attention, and problem-solving abilities through proper synchronization.
- **Optimal Immune Function:** Regulates immune responses to maintain health and resilience.
- **Coordination of Behavioral Activities:** Aligns foraging, hunting, and social interactions with environmental conditions.
- **Environmental Synchronization:** Helps synchronize activities with external cues like light, temperature, and food availability.
- **Seasonal Adaptations:** Regulates behaviors and adaptations in response to changing seasons.
- **Mood Regulation:** Linked to the regulation of mood and emotional well-being, contributing to mental health.

26. Explain social organization in primates.

Variety of social organization exists in primates. The group could comprise of one male and a group of females called harem, a multi male group or a large troupe.

1. Solitary ones are the lemurs, loris and tarsiers. They are arboreal, nocturnal and feeding on insects. They make contacts during the breeding season.
2. White handed gibbons are monogamous species. A pair lives with their offspring. The offspring move away after they become sexually mature. They are territorial.
3. The gelada baboons show variation in social organization depending on the availability of food. There are single male herds. There are herds with “single” male and a “harem” of females.

4. The mountain gorilla lives in small groups, headed by a single male and includes other males as well. They are not territorial.
5. Some of the smallest primate societies are seen in the gibbon and orangutan. Orangutans are an exceptionally solitary animal while the gibbons live as small family units, the father, mother and their offspring. Some of the largest groups are to be found in the terrestrial primates-baboon troops range up to 90.

27. What is instinctive behavior?

Instinctive behavior, also known as innate behavior, is the ability of an animal to perform a particular behavior in response to a given stimulus, the first time the animal is exposed to the stimulus. In other words, an instinctive behavior does not have to be learned or practiced. For example birds nesting behavior.

28. How dolphin shows altruism?

There are cases reported about the reciprocal altruism by dolphins. The surfer, Todd Endris was surfing at Marina State Park off Monterey, California, when he was suddenly attacked by a great white shark. The shark peeled the skin off his back and was biting on his right leg. A pod of bottlenose dolphins swam over and formed a protective ring around Endris, providing him a chance to escape from the shark and to swim back to shore where help was available. Moko, a bottlenose dolphin in New Zealand, helped two whales who were stranded on the beach by directing them to open sea.

29. What is ortho-kinesis and klino-kinesis?

ORTHO-KINESIS

It is a response that involves changes in the speed of movement of the whole body in response to stimuli like humidity, pressure and diffused light.

EXAMPLE:

- Woodlouse, *Porcellio scaber*, tends to lose water from their body fairly rapidly when exposed to low humidity.
- When kept at the junction in a choice chamber where one side has high humidity and the other half has low humidity.
- It begins to move and the speed of movement and the rate of turning is greatest in the driest part of the chamber.
- This increased and apparently random movement is an attempt by the animal to remain in the most favorable environment.

30. Write role of social behavior in defending male.

Females actively defend their territories against other females, while resident males protect prides from rival coalitions. Territory size depends on prey abundance, as well as access to water and denning sites.

The lion's roar is a territorial display that can be heard from at least five km away. Lions are able to count the number of individuals in a roaring group and will challenge the invaders if they safely outnumber them.

31. What is parental care?

Parental care is a behavioral and evolutionary strategy adopted by some animals, involving a parental investment being made to the evolutionary fitness of offspring. Patterns of parental care are widespread and highly diverse across the animal kingdom.

32. What is aggregation?

Many animals aggregate—which means they are socially attracted by others and group together—and receive in return benefits such as reduced predation risk or better access to resources or mates. When individuals aggregate, they interact with other group members, which can change the behaviour of the group as a whole.

33.