

# **ZOO403 – Animal Behavior**

## **Important Midterm Questions**

### **Q-1 Write behavior of Ring Dove.**

Male and female ring doves coordinate their participation in courtship, nest building, incubation and care of young.

### **Q-2 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.

### **Q-3 Define innate behavior.**

- Pattern of behavior is inherited. It is passed on from parents to offspring.
- It is unlearned behavior.
- It occurs in all the members of a species hence it is species specific and predictable.
- It is not dependent on past experience as it is an inborn response to a stimulus
- It takes place in individuals even when kept in isolation away from their fellow members
- Innate behavior has high adaptability and survival value.

### **Q-4 Define animal orientation.**

Ability of an animal to determine its position in space and move predictably with respect to specific stimuli.

Examples

- Standing up after falling down (orientation against gravity)
- Orienting towards incoming light
- Acoustic orientation
- Olfactory orientation

### **Q-5 Explain role of Nervous system in animal behavior.**

Nervous system plays an essential role for the human and other animal's behaviors. The behavior of an organism is manifested in response to the stimuli from the environment. The stimuli act as sensory input for the nervous system. In response to the sensory input, nervous system produces motor output that controls the contraction of muscles. All behavioral acts are generated by this motor output of the nervous system.

### **Q-6 Explain significance of habituation.**

Habituation is one of the simplest forms of learning. In habituation, an animal learns to ignore a repeated, irrelevant stimulus. It is defined as a loss of responsiveness to stimuli that convey little or no new information.

**Example :**

Many mammals and birds recognize alarm calls of members of their species. However, if these calls prove fake repetitively, they stop responding (the "cry-wolf" effect). An example of learning by habituation is observed in squirrels. When one squirrel feels threatened, the others hear its signal and go to the nearest refuge.

### **Q-7 Explain types of innate behavior.**

There are two types of innate behavior reflex and instinct. A reflex is an automatic response that does not involve a message from the brain. Reflex Examples: Sneezing, shivering, yawning, quickly pulling your hand away from a hot surface, blinking your eyes. An instinct is a complex pattern of innate behaviors.

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### **Q-8 Define panting behavior.**

When an animal pants, it evaporates water from internal body structures. Panting expels hot air and brings in cool air. This physiological response is used by many mammals, most birds, and some reptiles to cope up with the hot environment.

### **Q-9 Write characteristics of innate behavior.**

Innate behavior is behavior that's genetically hardwired in an organism and can be performed in response to a cue without prior experience. Reflex actions, such as the knee-jerk reflex tested by doctors and the sucking reflex of human infants, are very simple innate behaviors.

### **Q-10 Define taxis and its types.**

Taxis are the simplest type of innate or stereotyped behaviour. It is an orientation of an animal (directed either towards or away) in response to the source of stimulus. If the orientation is towards the stimulus it is called as positive taxis and if it is away from the stimulus it is known as negative taxis.

Taxes are usually named after the stimuli. Hence there are phototaxis, chemotaxis, thermotaxis, geotaxis etc. A plant or animal that move towards light shows positive phototaxis. Certain burrowing animals like rodents or planaria that move away from the source of light exhibits negative phototaxis.

### **Q-11 What is 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.

### **Q-12 Explain resting membrane potential.**

The plasma membrane of a resting neuron is polarized; the fluid on the inner side of the membrane is negatively charged with respect to the positively charged fluid outside the membrane. The difference in electrical charge between the inside and the outside of the membrane at any given point is due to the relative numbers of positive and negative ions in the fluids on either side of the membrane, and to the permeability of the plasma membrane to these ions. The difference in charge is called the resting membrane potential. All cells have such a resting potential, but neurons and muscle cells are specialized to transmit and recycle it rapidly. The resting potential is measured in

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millivolts (mV). A millivolt is 1/1,000 of a volt. Normally, the resting membrane potential is about -70 mV, due to the unequal distribution of various electrically charged ions. Sodium (Na) ions are more highly concentrated in the fluid outside the plasma membrane, and potassium (K) and negative protein ions are more highly concentrated inside.

The Na and K ions constantly diffuse through ion channels in the plasma membrane, moving from regions of higher concentrations to regions of lower concentrations. (There are also larger Cl<sup>-</sup> ions and huge negative protein ions, which cannot move easily from the inside of the neuron to the outside.) However, the concentrations of Na and K ions on the two sides of the membrane remain constant due to the action of the sodium potassium ATPase pump, which is powered by ATP. The pump actively moves Na ions to the outside of the cell and K ions to the inside of the cell. Because it moves three Na molecules out for each two K molecules that it moves in, the pump works to establish the resting potential across the membrane. Both ions leak back across the membrane down their concentration gradients. K ions, however, move more easily back to the outside, adding to the positive charge there and contributing to the membrane potential of -70 mV.

### **Q-13 Write properties of fix action pattern.**

A fixed action pattern (FAP) is a sequence of unlearned, innate behaviour that is unchangeable. Once initiated; it is usually carried to completion. It is hardwired, however, not purely genetic, may improve with experience. FAP is triggered by an external sensory stimulus known as “sign stimulus”.

This term is often associated with Konrad Lorenz, who is the founder of the concept. Lorenz identified six characteristics of fixed action patterns.

These characteristics state that fixed action patterns are stereotyped, complex, species-characteristic, released, triggered, and independent of experience

### **Q-14 Write a brief note on web making in spider**

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. Spider's 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."

The main reason spiders spin webs is to catch the prey. When an insect, such as a fly, flies into a spider's web, it gets stuck on the sticky threads. When a spider catches prey in the sticky strands of its web, it approaches the trapped insect and uses its fangs to inject venom. The venom either kills or paralyzes the prey.

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### **Q-15 Define pheromones and write its role.**

A pheromone is a secreted or excreted chemical factor that triggers a social response in members of the same species. Pheromones are chemicals capable of acting like hormones outside the body of the secreting individual, to affect the behavior of the receiving individuals.

Pheromones assist in reproduction, feeding, social interactions and maternal-neonatal bonding in mammals. Bees, wasps, ants, moths and other insects rely largely upon pheromones as a means of communication. Pheromones are chemical substances which may be secreted in urine, dung or produced by special glands. They are usually given off by the female of the species to attract males.

### **Q-16 What are types of learning?**

Types of learning include habituation, sensitization, classical conditioning, operant conditioning, observational learning, play, and insight learning. One of the simplest ways that animals learn is through habituation, where animals decrease the frequency of a behavior in response to a repeated stimulus.

### **Q-17 Write experiment of Angelo Arago imprinting.**

Angelo d'Arrigo extended the technique used by Konrad Lorenz. He noted that the flight of hang-glider is very similar to the flight patterns of migratory birds. Both use updrafts of thermal currents to gain altitude that then permits soaring flight over distance. He used this method to reintroduce threatened species of raptors. As birds hatched in captivity have no mentor birds to teach them traditional migratory routes, D'Arrigo hatched chicks under the wing of his glider and they imprinted on him. Then, he taught the fledglings to fly and to hunt. The young birds followed him not only on the ground (as with Lorenz) but also in the air as he took the path of various migratory routes.

### **Q-18 What is a positive and negative taxis?**

A positive taxis is one in which the organism or a cell moves towards the source of stimulation (attraction). A negative taxis is when the organism or a cell moves away from the source of stimulation (repulsion).

A negative taxis is when the organism or a cell moves away from the source of stimulation (repulsion). Taxis is also different from tropism, which is an involuntary orienting response; positive or negative reaction to a stimulus source.

### **Q-19 What are advantages of pheromones?**

Pheromones are chemical signals, that is, carriers of information between individuals within a species. Pheromones induce a physiological or behavioral response in the receiving individual, and often play a crucial role in mate finding and other interactions among animals.

### **Q-20 Write name of animals that show animal cognition.**

Researches have examined animal cognition in:

- Mammals such as primates, cetaceans, elephants, dogs, cats, horses, cattle, raccoons and rodents.
- Birds such as parrots, fowl and pigeons.
- Reptiles such as lizards, snakes and turtles.
- Fishes
- Invertebrates such as cephalopods

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**Q-21 Differentiate between morphological and behavioral responses.**

### **Morphological Responses**

- changing in the body appearance
- growing thicker fur or change in fur color in winter

### **Examples:**

- chameleon change colour when it feel threatened.
- Arctic hare change its coat colour from blue-grey to white for better camouflage during winters and turn again to blue-grey in spring.

### **Behavioral Responses**

- changing behavior to adapt to the change
- moving to a more favorable location
- cooperative behavior
- agonistic behavior when threatened

### **Examples:**

- During the winter season, Houbara bustard finds refuge in plain lands of Sindh, Southern Punjab and Balochistan.

**Q-22 What is learned behavior?**

Learned behaviors are modified by experience. They are variable and changeable. They are flexible with a complex & changing environment.

### **For example:**

By watching their mother, baby ducks learn how to avoid danger and to know what is good to eat. This is an example of learned behavior.

**Q-23 Explain nesting in birds.**

95% of bird species are socially **monogamous** i.e., a male and female bird will pair for atleast the length of the breeding season or, in some cases, for several years or until the death of one mate. Monogamy allows for care of the fledglings by both parents. Some birds are polygamous; they have many mates in a breeding season. Birds eggs are usually incubated by the parents. Most birds have an extended period of parental care after hatching. The length and nature of parental care varies widely amongst different orders and species.

Q-24