TOPIC: ANIMAL BEHAVIOUR AND PATTERNS OF LEARNING

Time: 2 ½ hours

Attempt all questions in this paper

SECTION	MARKS
A	
B	
TOTAL	

SECTION A (40 MARKS)

1. Imprinting can be described as
   A. A behavior that involves recognizing a print mark
   B. An innate behavior that requires practice
   C. Learning that occurs at a critical period in early development
   D. Learning that requires a sign stimulus.
2. Which one of the following patterns of behavior in rat would be a result of latent learning?
   A. Avoiding to eat poisoned food
   B. Associate smell with presence of food
   C. Young rats following their mother D. Being aware of escape route
3. Which of the following is **not** correct about instinctive behaviour?
   A. Is permanent adaptive trait
   B. Can be developed in animals reared in isolation
   C. Allow synchronization of sexual behavior D. Develop independently of the environment
4. When same response is given to the same stimulus on different occasion, the behavior is said to be A. Instinctive
   B. Conditioned
   C. Imprinted
   D. stereotyped
5. Hormones influence behavior in the following ways except
   A. affecting the growth of nerve connections in the brain
   B. directly affecting nerve cell and synapses within the central nervous system
   C. altering the sensitivity of peripheral receptors D. inducing RNA changes to quicken the learning process
6. Which one of the following is an advantage of social behavior among animals?
   A. No incidence of cannibalism
   B. Decreased susceptibility to diseases
   C. Increased reproductive efficiency
   D. Decreased competition
7. Migration of birds during winter from temperate regions to the tropics is an example of
   A. Habituation
   B. Insight learning
   C. Imprinting
   D. Exploratory learning
8. Which one of the following is not a purpose for courtship behavior among animals?
   A. Establishing a territory
   B. Ensuring that both partners are sexually mature
   C. Establishing a pair bond
   D. Ensuring that both partners are ready for mating
9. Birds learn to ignore a scare crow that is left in the same spot for a long time. This type of behavior is called
   A. Associative learning
   B. Habituation
   C. Imprinting
   D. Conditioning
10. The type of learning that involves the immediate understanding and responding is
    A. imprinting
    B. associative learning
    C. insight learning
    D. habituation
11. Which one of the following, types of behavior is **least** learnt?
    A. Associative
    B. Instinct
    C. Imprinting
    D. Insight
12. Which one of the following does not result from territorial behaviors?
    A. Reduced competition within a herd
    B. Increased variation among off springs
    C. Reduced frequency of genes from weak individuals
    D. Increased inbreeding
13. Which is instinctive behavior?
    A. Courtship and display ceremonies in birds and insect
    B. Avoiding the capture of a distasteful insect by bird
    C. Migration of birds
    D. Chicks taking cover when a kite is passing
14. When an earthworm encounters an unfavorable stimulus it quickly withdraws. This is an example of
    A. A conditioned reflex
    B. An escape response
    C. Chemotaxis

D. A terminating stimulus

15. Which one of the following best describes association learning?
    A. Preying bird avoiding to eat a bright colored caterpillar
    B. Rat eventually learning to transverse a maze if rewarded
    C. Chick following the first moving object it sees after hatching
    D. Chimpanzee using a stick to reach an object
16. Which one of the following would not be caused by seasonal changes in migratory birds?
    A. Hormonal changes
    B. Feeding behaviors
    C. Reproductive behaviors
    D. Plumage coloration
17. Which one of the following patterns of behavior in rats would be a result of latent learning?
    A. Being aware of escape routes.
    B. Avoiding to eat poisoned food.
    C. Associating smell with presence of food.
    D. Young rats following their mother.
18. What type of learning is exhibited by a predator when it avoids eating a brightly colored prey?
    A. Exploratory
    B. Habituation
    C. associative
    D. Trial and error
19. For a migratory bird, its real home is a place
    A. To which it migrates
    B. Where it earlier was
    C. From where it lays eggs
    D. It obtains food from
20. Behaviours traits or organisms are controlled by
    A. Genotype
    B. Environment
    C. Interaction of its genotype and environment
    D. Training by parents
21. In honey bee – *Apis mellifera*, society, the worker castes consist of
    A. Male only
    B. Females only
    C. Both males and females
    D. Drones
22. In termites, the primary productive male (the king) is characterized by which of the following behaviours
    A. Stays with queen after the nuptial flight
    B. Dies soon after the nuptial flight
    C. Dies during mating
    D. Says alone without queen
23. Migration in birds is set off by increase in the hormone secreted by which of these glands
    A. Adrenal gland
    B. Pituitary gland
    C. Thyroid gland
    D. Gonads
24. Parental care is more pronounced in fishes which lay
    A. Large number of eggs
    B. Small number of eggs
    C. Moderate number of eggs
    D. There is no specific rule
25. Before going out to gather food, honey bees indulge in one of the following acts
    A. Perform a dance
    B. Take long rest
    C. Feed upon royal jelly
    D. Make many short distance flights
26. The endogenous rhythms the usually fall short of 24-hour periodicity are called
    A. Circannual
    B. Circadian
    C. Seasonal
    D. Lunar
27. Which of the following fishes exhibits a degree of parental care?
    A. *Cyprinus carbio*
    B. *Catla catla*
    C. Tilapia sp
    D. *Cirrhinus mrigala*
28. Which of the following infects shows social behaviour?
    A. Locusts
    B. Beetles
    C. Bugs
    D. Termites
29. Traits that increase an individual's ability to attract a mate appear with increased frequency as a result of
    A. A fixed action pattern behaviour
    B. Behaviour selection
    C. Sexual selection
    D. Communication
30. The ability to perform a behaviour is often innate, but the final shape of the inherited behavior is often the result of
    A. Learning
    B. Habituation
    C. Operant learning
    D. Imprinting
31. A scientist asks questions about a behaviour to understand the
    A. Role of genetics in the behaviour
    B. Evolution of the behaviour
    C. Effect it has on survival
    D. All of the above

32. Extreme traits such as antlers, horns and lion manes that are found in male animals but not in female animals are the result of
    A. Evolution
    B. Sexual selection
    C. Natural selection
    D. All of the above
33. The bird providing food to its young is engaging in
    A. Foraging behaviour
    B. Parental care
    C. Imprinting
    D. Territorial behaviour
34. When imprinting, young birds will follow
    A. Only their mother
    B. Only members of other species
    C. The first moving object they see
    D. Only members of their species
35. Animal signal are used to
    A. Influence an animal's behaviour
    B. Solicit play
    C. Attract a mate
    D. All of the above
36. Sexual selection is a(n)
    A. Innate behaviour
    B. Evolutionary mechanism
    C. Behaviour signal
    D. Genetic trait
37. Which of the following is NOT a signal?
    A. Feeding
    B. Sound
    C. Color
    D. Scent
38. Fiddler crabs emerging from their burrows at specified intervals is an example of a
    A. Lunar cycle
    B. Circadian rhythm
    C. Annual rhythm
    D. Weekly cycle
39. A benefit of living in a social group is
    A. Sharing of mates
    B. Reduced risk of disease
    C. Protection from predators
    D. All of the above
40. Birds flying south for the winter are demonstrating
    A. Seasonal rhythms
    B. Exploratory behaviour
    C. Migratory behaviour
    D. Hibernation

SECTION B (60MARKS)

41. (a) Define the term imprinting. (1mark)

.....

.....

.....

.....

(b) Explain how imprinting behaviour is influenced by both hereditary and learning. (4marks)

.....

.....

.....

.....

.....

.....

(c) Outline two examples of imprinting behaviors in animals. (2marks)

.....

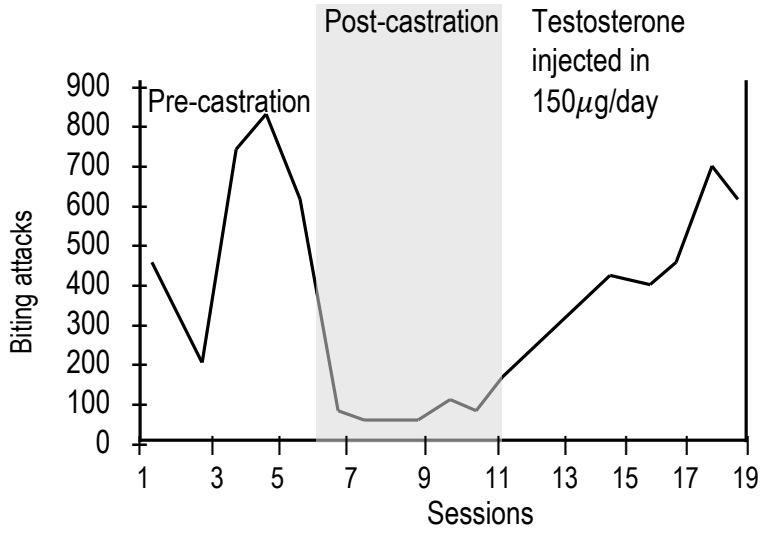
.....

(d) describe how imprinting is important in animals. (3marks)

.....

.....

42. Certain behaviour are usually only observed in males of species. For example, urine marking, aggressiveness, vocalization. A study on mice shows patterns of aggression before and after castration, a procedure where the testes of the mice were removed. The results in which testosterone hormone was later administered by injection in to the castrated mice are represented in the graph below. Use it to answer questions that follow.



(a) Define the term aggression in relation to animal behaviour. (1mark)

.....

.....

.....

.....

(b) (i) Describe the trends in each session of the graph. (3marks)

.....

.....

.....

.....

(ii) State how this study suggests the relationship between testosterone and behaviour. (1mark)

.....

.....

(c) Mention the roles of hormones in behaviour. (3marks)

.....

.....

.....

.....

(d) How are aggressive behaviours important in animals? (2marks)

.....

.....

.....

43. Homeostatic mechanisms across phyla reflect continuity due to common ancestry and change due to evolution. Organisms use feedback mechanisms to regulate growth and reproduction and to maintain dynamic homeostasis. On addition to ensure survival, organisms also use taxis and kinesis behaviours. A researcher places a dead rotting mouse on one side of a testing chamber and then adds 10 beetles to each side of the chamber. The beetles can either choose to go in the direction of the rotting mouse or a way from the rotting mouse. The researcher then collects data on the movements of the beetle, recoding how many beetles were on which side of the chamber. The data is shown below.

	Number of beetles observed on each side of the chamber	
Time	Rotting mouse	Empty
0 minute (start)	5	5
1 minutes	4	6
2 minutes	6	4
3 minutes	8	2
4 minutes	9	1
5 minutes	8	2

(a) Distinguish between taxis and kinesis. (2marks)

……

……

……

……

(b) (i) Based on the data, what do you conclude about the beetles behaviour. (1mark)

……

……

(ii) Do they exhibit taxis or kinesis? Explain your answer. (3marks)

……

……

……

……

(iii) State other two examples of such behaviour in animals. (1mark)

……

……

(c) What evolutionary advantages would these behaviours serve? (3marks)

……

……

……

……

44. (a) What is the difference between exploratory and conditioning patterns of learning. (1mark)

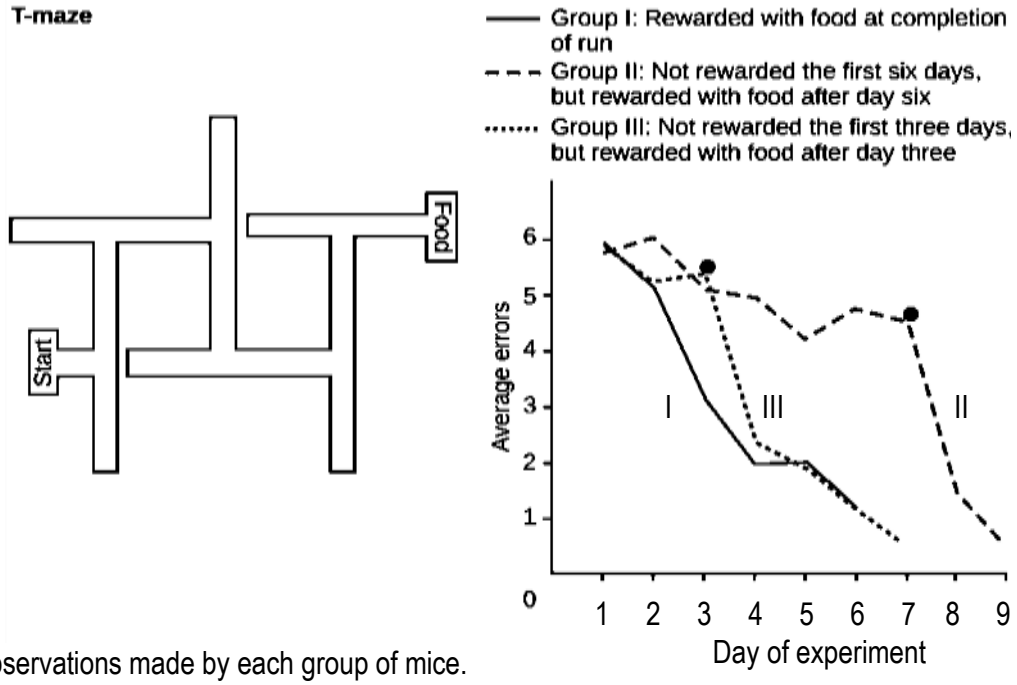
……

……

……

……

(b) Maze running experiments done with rats by H.C. Blodgett in the 1920s were the first to show a particular form of learning in a simple mammal. The motivation for the maze was a piece of food at its end. In these studies, the animals in Group I were ran in one trial per day and had food available to them each day on completion of the run. Group II rats were not fed in the maze for the first six days and then subsequent runs were done with food for several days after. Group III rats had food available on the third day and everyday thereafter. These findings are summarized below. The black dots on the group II and III lines show the days when food rewards were added t the maze.



(i) Describe the observations made by each group of mice. marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(ii) Which form of learning was investigated in the experiment? Give a reason for your answer. (2marks)

.....

.....

.....

(iii) How is the above type of learning ecologically important to the organism. (1mark)

.....

.....

45. With clear reasons and their subsequent roles in organisms, identify the form of learning in each of the following patterns described below.

a) Prairie dogs typically sound an alarm call when threatened by a predator. At first they will give this alarm call in response to hearing human steps, which indicate the presence of a large potentially hungry animal. However, the prairie dogs gradually become familiar to the sound of footsteps, as they repeated experience the sound without anything bad happening. Eventually, they stop giving the alarm call in response to footsteps.

Form of learning (½ marks)

.....

Reason (1mark)

.....

.....

Role to organism (2marks)

.....

.....

(b) in the efforts to rehabilitate the endangered whooping crane by raising chicks in captivity. Biologists dress up in full whooping crane costume while caring for the young birds, ensuring that they don't follow humans but rather on the bird dummies that are part of the costume. Eventually, they teach the birds to migrate using an ultralight aircraft, preparing them for release in to the wild.

Form of learning (½ marks)

.....

Reason (1mark)

.....

.....

Role to organism (2marks)

.....

.....

(c) A psychologist B. F. Skinner, is an inventor of the Skinner box. Skinner put rats in boxes containing a level that would disperse food when pushed by the rat. The rat would initially push the lever a few times by accident, and would then begin to associate pushing the lever with getting the food. Over time, the rat would push the lever more and more frequently in order to obtain the food.

Form of learning (½ marks)

.....

Reason (1mark)

.....

.....

Role to organism (2marks)

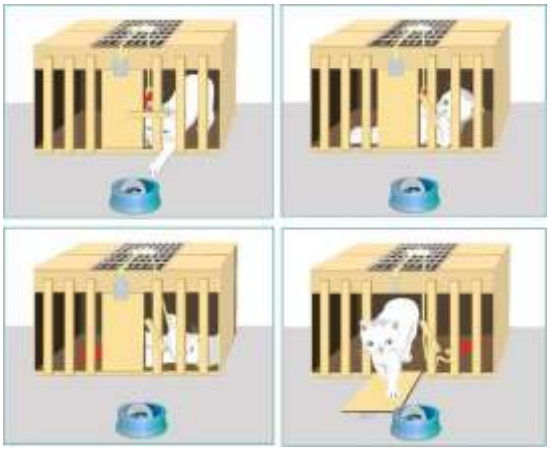
.....

.....

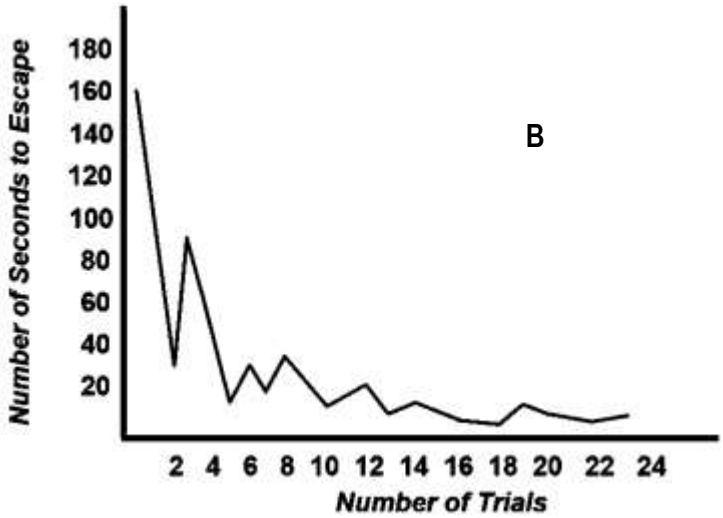
.....

46. In 19th century, E. Thorndike performed experiments on ability of various animals to learn. As a technique, he used the so called **puzzle box** invented by him, labelled A in the figure below. Particularly in the experiments with cats rather than insects like ants, he measured the time that a cat needed to escape from the puzzle box to acquire food outside the box. A typical sequence of escape time measurement was presented as B in the figure. From his findings, he formulated the **law of effect**. Use this information to answer questions that follow.

A



B



(a) (i) What do except the law of effect describes. (1mark)

.....

.....

(ii) Give a reason why Thorndike used a cat not an insect. (2marks)

.....

.....

.....

.....

(b) Use B in the figure to explain the results of this experiment. (4marks)

.....

.....

.....

.....

.....

.....

.....

(c) State three adaptations that enable an animal to learn by this form. (3marks)

.....

.....

.....

END