

Cognitive Processes

EXERCISES [PAGES 42 - 43]

Exercises | Q Q.1 (1) | Page 42

Choose the correct alternative and complete the sentence:

When we select few stimuli from the environment and bring them into the center of our awareness, it is called _____.

1. **attention**
2. perception
3. thinking

Solution: When we select few stimuli from the environment and bring them into the center of our awareness, it is called attention.

Exercises | Q Q.1 (2) | Page 42

Choose the correct alternative and complete the sentence:

Ivan Pavlov is known for explaining learning by _____.

1. **classical conditioning**
2. operant conditioning
3. observation

Solution: Ivan Pavlov is known for explaining learning by classical conditioning.

Exercises | Q Q.1 (3) | Page 42

Choose the correct alternative and complete the sentence:

When we organise the information from the environment, group them and give some meaning, that process is called _____.

1. attention
2. **perception**
3. thinking

Solution: When we organise the information from the environment, group them and give some meaning, that process is called perception.

Exercises | Q Q.1 (4) | Page 42

Choose the correct alternative and complete the sentence:

In operant conditioning the experiment was conducted on_____.

1. dog
2. **rat**
3. monkey

Solution: In operant conditioning the experiment was conducted on rat.

Exercises | Q Q.1 (5) | Page 43

Choose the correct alternative and complete the sentence:

The change in behaviour due to practice or experience is known as _____.

1. perception
2. thinking
3. **learning**

Solution: The change in behaviour due to practice or experience is known as learning.

Exercises | Q Q.2 (1) | Page 43

Answer briefly in 30 to 40 words:

What is fluctuation of attention?

Solution: Attention is the mental process of bringing a few stimuli into the centre of awareness out of the many stimuli present. It is difficult to attend to a single stimulus for a long period of time. Our attention shifts from the original stimulus to another stimulus for a fraction of time and then come back to the original stimulus. This may be due to factors like fatigue, decreased interest, etc. In most cases, attention fluctuates due to the limitations of human attention and hence cannot be totally eliminated.

Exercises | Q Q.2 (2) | Page 43

Answer briefly in 30 to 40 words:

Give three examples of top down processes in perception.

Solution: Three examples of top down processes in perception are:

1. If we read a book and some of its words are blurred due to a few sprinkles of water drops, we are still able to perceive the content entirely based on the context.

2. Many times, when we are on a phone call, the voice may break due to bad connectivity. Even when we miss a few words, we still perceive what the other person has to say.
3. If a person's handwriting is difficult to understand, we may find it easier to perceive the content when we read complete sentences rather than when we read isolated words.

Exercises | Q Q.2 (3) | Page 43

Answer briefly in 30 to 40 words:

What is meant by thinking?

Solution: Thinking is the mental activity that uses various cognitive elements and processes that involves the manipulation of information.

The core elements of thinking are -

1. **Mental representation** - It is a coded internal sensation acquired by direct experiences through the sense organs or by indirect experiences such as narrations, pictures, etc.
2. **Concepts** - They form the basis for all cognitive processes, acting as building blocks by connecting with each other to form more complex concepts.
3. **Schema** - It is an internal representation that organizes knowledge about related concepts and relationships among them.
4. **Language** - Mental representations, concept, and schema are represented by language, for e.g., the word 'cat' is a symbol for a 'cat'.

Exercises | Q Q.2 (4) | Page 43

Answer briefly in 30 to 40 words:

Describe any two processes of learning.

Solution: Two processes of learning are:

1. **Learning by observation:** We learn many things by observing someone's behaviour and reproducing it later. e.g. eating, walking. We also observe and imitate certain ways of thinking, evaluating, judging, and decision making.
2. **Learning by assimilation and accommodation:** We keep refining the existing concepts in our brain based on new experiences or new information. This process of forming and refining our concepts on the basis of similarities and differences is called learning by assimilation and accommodation.

Exercises | Q Q.3 | Page 43

Classify the following into Mental Representation, Concepts and Schemata:

1. Image of your mother in your mind
2. Building
3. Tree

4. School
5. Theater
6. Table
7. Neil Armstrong

Solution:

| Mental Representation | Concepts | Schemata |
|------------------------------|----------|----------|
| Image of your mother in your | Building | School |
| Neil Armstrong | Tree | Theater |
| | Table | |

Exercises | Q Q.4 (1) | Page 43

Find odd one out:

1. **Schema**
2. Perception
3. Attention
4. Thinking

Solution: Schema

Exercises | Q Q.4 (2) | Page 43

Find odd one out:

1. Searching solution
2. Defining problem
3. **Incubation**
4. Implementation of the solution

Solution: Incubation

Exercises | Q Q.4 (3) | Page 43

Find odd one out:

1. Reasoning
2. Judgement

3. Decision making

4. Relaxing

Solution: Relaxing

Exercises | Q Q.4 (4) | Page 43

Find odd one out:

1. Concept

2. Schema

3. Solution

4. Mental Representation

Solution: Solution

Exercises | Q Q.5 (1) | Page 43

Identify if the following behaviours are due to learning or not. Give reasons for your answers.

After much hard work you are able to perform a dance step properly.

Solution: It is due to learning as it involves a relatively permanent behavioural change due to practice.

Exercises | Q Q.5 (2) | Page 43

Identify if the following behaviours are due to learning or not. Give reasons for your answers.

In spite of getting hurt, Shayana, a five year old child, continues to play with knife.

Solution: In this case, the behaviour can't be attributed to learning. This is because even after her past experiences, Shayana has not learned that she should not play with knife in order to avoid getting hurt.

Exercises | Q Q.5 (3) | Page 43

Identify if the following behaviours are due to learning or not. Give reasons for your answers.

Once Hanif had to pay fine for breaking the signal while driving a car. Now he makes sure to stop the car at red signal.

Solution: It is due to learning as Hanif has made an association between breaking the signal and paying a fine, i.e., negative consequences.

Exercises | Q Q.6 (1) | Page 43

Answer the following questions with the help of the given points :

Explain the stages of problem solving.

Points :

1. Defining problem
2. Generating alternative solutions
3. Selecting solution
4. Implementing and taking follow up of the solution.

Solution:

1. While defining a problem, a person needs to identify and define the problem correctly. If a person defines it incorrectly, he will never reach the solution.
2. For every problem, there are various solutions, out of which only some will be effective. In this step, a person tries to search for all possible actions that can solve a problem.
3. A person selects one solution out of many possible ones based on his reasoning ability. Reasoning ability enables him to solve problems more realistically. He may select an option that helped him to solve a similar problem in the past.
4. A person actually tries out a certain solution and evaluates the outcome on the basis of whether it has helped him to resolve the problem or not. If the problem is still unresolved, he might have to go to one of the previous steps and carry out the problem-solving procedure again.

Exercises | Q Q.6 (2) | Page 43

Answer the following questions with the help of the given points :

Explain the stages of creative thinking.

Points :

1. Preparation
2. Incubation
3. Illumination
4. Verification

Solution: Creative thinking is characterised by the ability to perceive the world in new ways, to find hidden patterns, etc. It is a way of looking at problems or situations from a fresh/novel perspective. It involves divergent thinking that focuses on the exploration of ideas and generating many possibilities. It is referred to as "thinking outside of the box." Researchers, poets, designers, filmmakers always think in a creative way.

The four stages in creative thinking are -

- i. **Preparation** - This involves formulating the problem and gathering information about it. Many tentative solutions are tried out and discarded. No progress seems to be made by the person.
- ii. **Incubation** - If the person does not get the required results, he/she may focus on things unrelated to that problem. The period helps to work out the problem without consciously thinking about it. The incubation period appears to be non-fruitful.
- iii. **Illumination** - After incubation, suddenly the correct solution appears to the person, due to which he/she experiences excitement. It seems that a solution has fallen into place.
- iv. **Verification** - The new solution may need to be evaluated a number of times. In most cases, minor changes will be required but sometimes it may demand a major overhaul of the entire process.
For e.g., A teacher asks the students to think of unusual uses for a bottle.
 - a. The students will begin brainstorming.
 - b. The students will come up with many uses for e.g., to store liquids, to hold plants, etc. But these are not unusual uses. They will give up and focus on something else.
 - c. The students will suddenly find novel uses for the bottle e.g., juggling, etc.
 - d. The students will verify these solutions with their teacher.

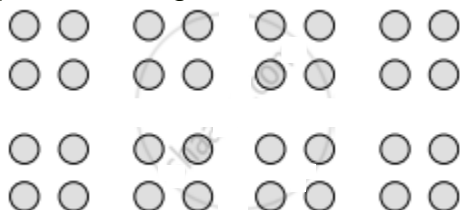
Exercises | Q Q.7 (1) | Page 43

Answer the following questions in detail:

Explain the laws of perceptual organization.

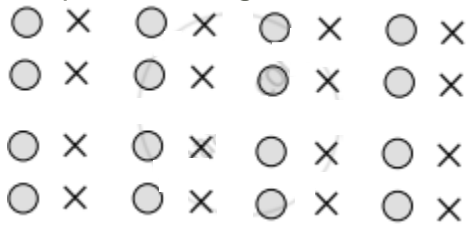
Solution:

1. **Law of proximity:** According to this law, the stimuli that are near each other are perceived together than the stimuli that are far away from each other.



In the above image, we perceive pairs of dots in each line as the dots which are near to each other are perceived together. So, instead of perceiving a line of eight dots, generally, a line of four pairs of dots is perceived.

2. **Law of similarity:** According to this law, the stimuli that are similar to each other are perceived together than stimuli that are distinct from each other.



In the above image, we perceive four alternate vertical lines of circles and crosses since similar stimuli are perceived together. Generally, we do not perceive four horizontal lines with circles and crosses in alternate sequence.

3. **Law of continuity:** According to this law, there is a tendency to perceive a stimulus in continuation as per its established direction. Also, when two stimuli intersect, a continuation of each stimulus is perceived apparently



In the above image, a straight vertical line and a straight horizontal line are perceived together as a letter 'L' and a cutting line is perceived separately. Generally, we do not perceive four different lines going in different directions.

4. **Law of closure:** According to this law, there is a tendency to perceive an incomplete stimulus in a complete manner.



In the above image, our brain fills up gaps in incomplete stimulus and we perceive it as a triangle and square. Generally, we do not perceive it as three/four separate lines going in different directions.

Exercises | Q Q.7 (2) | Page 43

Answer the following questions in detail:

Explain the core elements of thinking.

Solution: Thinking is the mental activity that makes use of ideas or symbols instead of an overt activity. The types of thinking are (i) Perceptual (concrete) thinking, (ii) Conceptual (abstract) thinking (iii) Reflective thinking, (iv) Creative thinking. The core elements in thinking are -

1. **Mental representation** - It is a coded internal sensation acquired by direct experiences through the sense organs or by indirect experiences such as narrations, pictures, etc. Mental representation is the mental imagery with the help of which the brain codes and stores the information. It is like a hypothetical

internal cognitive symbol used by the brain to represent external reality.

Example: a child is asked to imagine a peacock. The visual image of a peacock with its colourful plumage immediately comes to mind. This refers to the "mental imagery" of an object.

2. **Concepts** - They form the basis for all cognitive processes, acting as building blocks by connecting with each other to form more complex concepts. Concepts involve the extraction of some 'idea' on the basis of similarities and differences among the sensations. A concept is an idea that represents a class of objects, situations, etc which differentiates it from other classes of objects, situations, etc., for e.g. a child forms a mental image of a 'dog'. He derives an idea of something similar in all examples of 'dog' that he has seen i.e. tail, fur, barking, etc. Thus, he has formed the concept of a dog. If he mistakenly identifies a cat as a dog. he is corrected by others. So he tries to compare the mental images of dogs and cats. He has now learned and refined two concepts viz. dog and cat.
3. **Schema** - It is an internal representation that organizes knowledge about related concepts and relationships among them. Schema involves arranging many concepts in a particular system or organisation. It describes a pattern of thought or behavior that organises categories of information and the relationships among them. A child tries to organise the concepts that he has learned in a systematic way to generate a higher-order understanding of patterns about information collected, for e.g. when a child visits a 'zoo' for the first time, images and concepts such as of different animals, cages/cages, etc., are activated in the brain simultaneously. Thus, he is forming the schema of 'zoo'.

Conclusion:- Mental representation is sensory experiences in the form of mental images in the brain. Many similar mental representations denote concepts while many concepts put in a particular relationship to each other are schema.

Exercises | Q Q.7 (3) | Page 43

Answer the following questions in detail:

With the help of your own examples explain the difference between distraction of attention and fluctuation of attention.

Solution:

1. **The distraction of attention:** After focusing on a specific stimulus, our attention may drift towards another stimulus due to some external or internal disturbances. This is known as the distraction of attention. Example: While eating, our attention may get distracted if a doorbell rings (external factor) or it may drift due to anxiousness (internal factor).
2. **The fluctuation of attention:** We cannot pay attention to a single stimulus for a long period of time. Our attention shifts towards other stimulus for a fraction of time and comes back to the original stimulus. This is known as the fluctuation of attention.
Example: When we are paying attention to eating, our attention may temporarily shift to a crow sitting on the branch of a tree outside our window and then again we pay attention to eating.