

Learning & Memory

Quiz 1

17.5
20

Instructions: Each question carries 1 mark
Only Q10 and Q11 carry 2 marks each

Total Marks - 20 marks
Time - 45 mins

1. Tanishk drank coffee for the first time and found it bitter and nauseating but after a few minutes he felt alert and pleasant. This may be explained by -

- A. Opponent-process theory
- B. Sensitization
- C. Dual-process theory
- D. Familiarity

1

2. A regular casino player is using a slot machine. Over time, they have learned that when three "Golden Bells" appear on the screen, a cash payout always follows 2 seconds later. One day, the three "Golden Bells" appear, the player leans forward in anticipation, but due to a mechanical error, no money comes out. According to the Reward Prediction Error hypothesis, what is happening to the dopamine neurons in the player's midbrain at the exact moment the money *should* have dropped?

- A) The neurons fire a rapid burst because the cash was not delivered
- B) The firing rate drops due to prediction error.
- C) The firing rate remains steady because expectation was already evaluated.
- D) The time taken by the machine is being calculated by the dopamine neurons.

3. After the first several weeks of his pet grooming business, Jeeva is able to distinguish the breeds of pets. This is an example of:

- a. habit formation
- b. latency learning
- c. perceptual learning
- d. priming

1

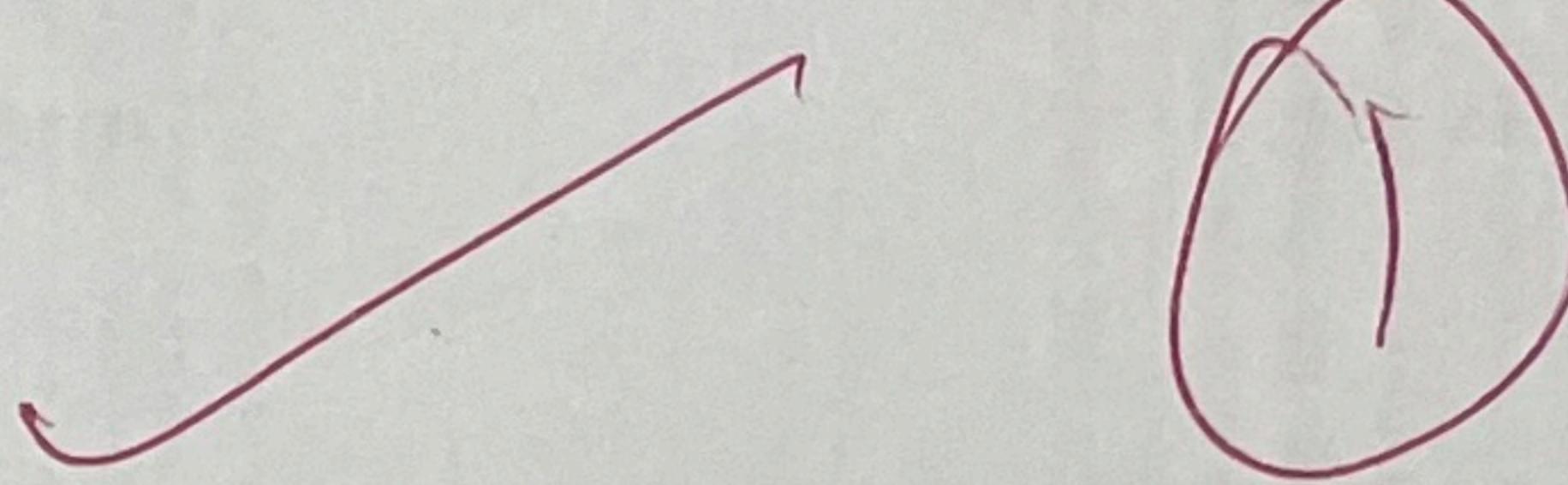
4. A young girl observes how much her brother worries about his car being scratched. She waits for the moment he sits down to yell out, "A branch fell on your car!" Her brother runs to check on his car, realizes it was a joke, and walks away upset. The young girl continues this numerous times. One day, she looks out the window and notices that a branch is about to fall on the car. She calls out to her brother and is ignored. This is an example of the dangers of:

- a. habituation
- b. latent inhibition
- c. orienting response
- d. perceptual learning

1

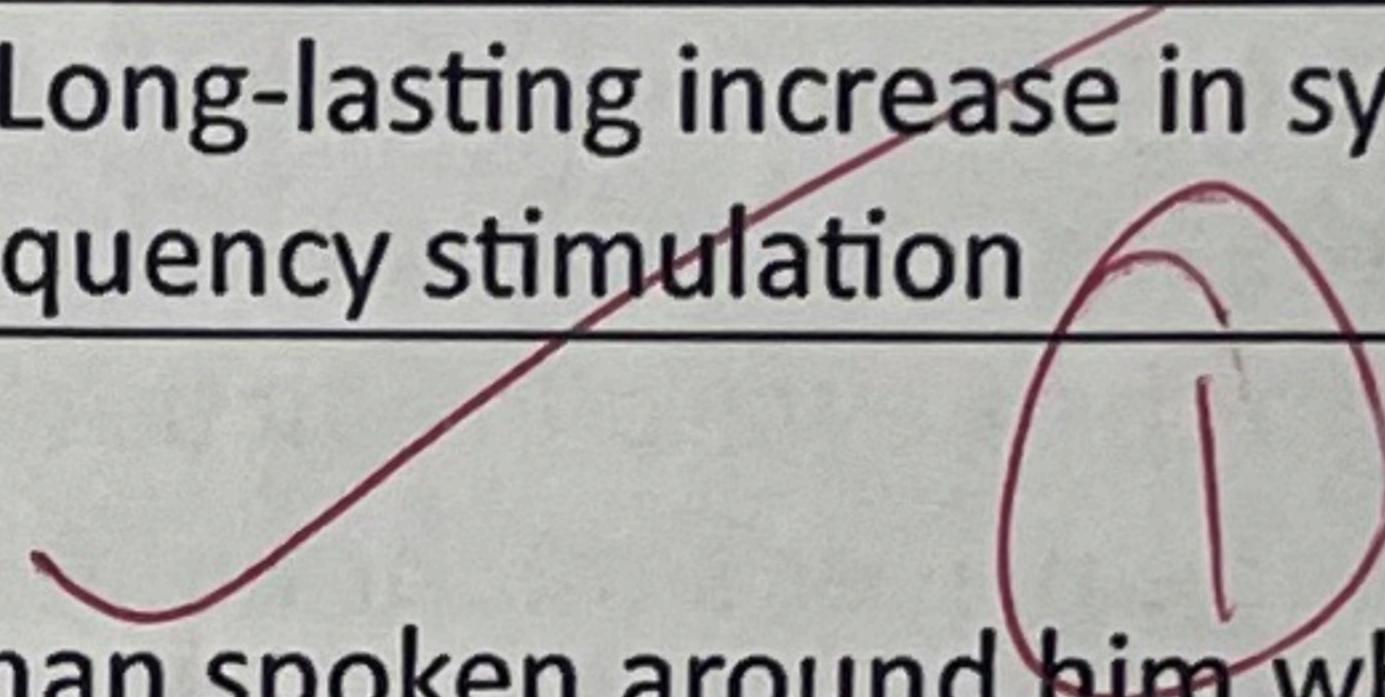
5. Since her sister's recent illness, Anjali has a heightened awareness of her family's health, and gets overly worried anytime a family member appears the least bit unwell. This is an example of:

- a. habituation
- b. sensitization
- c. dishabituation
- d. priming



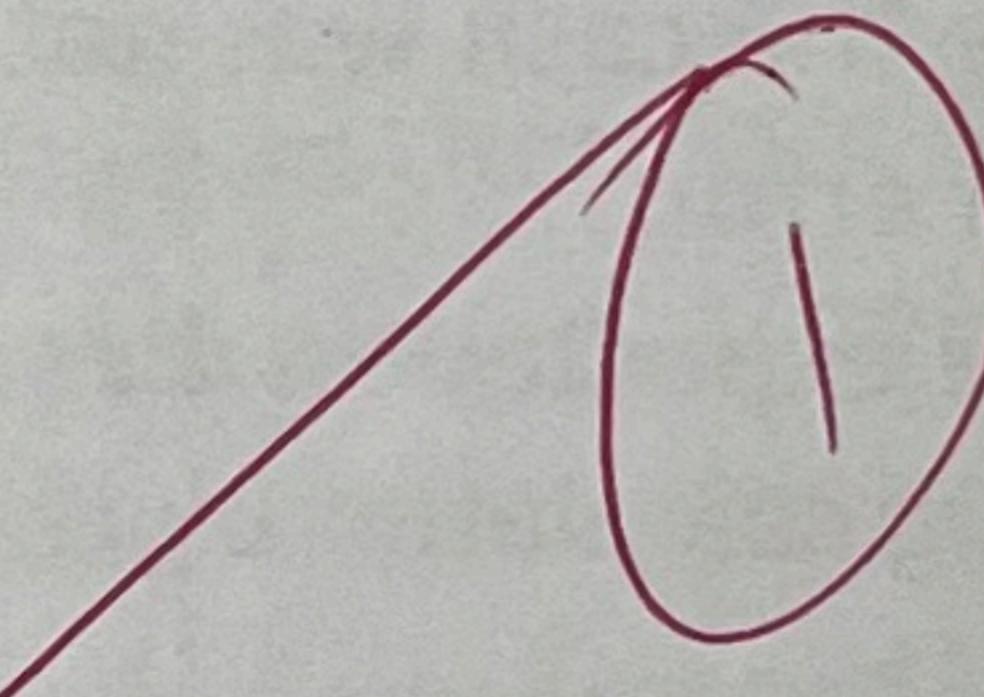
6. Match the following –

1. Temporal Summation	A. Simultaneous integration of inputs from multiple presynaptic neurons
2. Spatial Summation	B. Persistent weakening of synaptic strength following low-frequency stimulation
3. Long term potentiation	C. Summation of postsynaptic potentials due to rapid successive firing of a single synapse
4. Long term depression	D. Long-lasting increase in synaptic efficacy following high-frequency stimulation



7. Manish frequently heard German spoken around him while living in Berlin. He picked up words and sentences which were often used. This type of learning is best described as:

- A. Perceptual learning
- B. Statistical learning
- C. Classical conditioning
- D. Operant conditioning



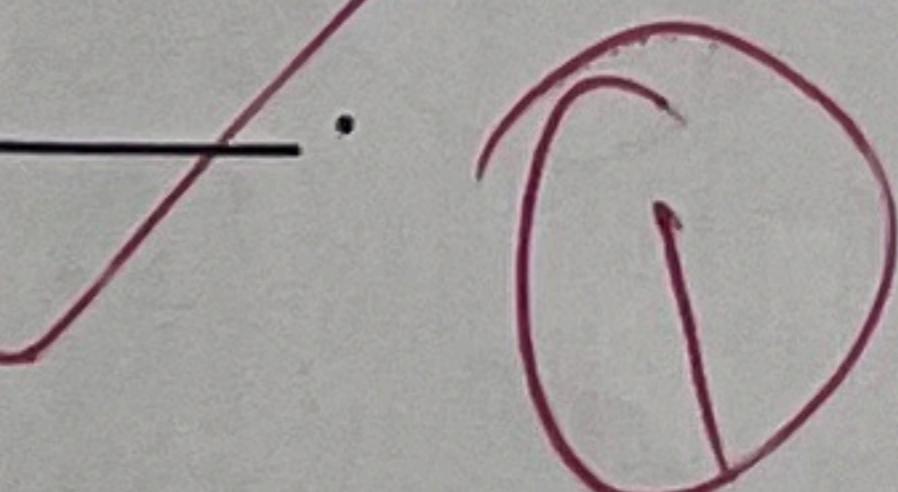
8. Which changes in a neuron indicate that learning took place?

- 1. Dendritic spines emerge in neurons involved in learning.
- 2. More neurotransmitters in pre-synaptic neurons
- 3. Increase in number of receptors in post-synaptic neuron (signalled by Ca^{2+} ions).



9. Rahul enters a noisy bakery and smells freshly baked bread. While sitting at the table for his order, he opens his laptop and focuses on his work. The noise is no longer disturbing him because of HABITUATION

while the smell of bread dies out due to



10. Give an example of emotional priming and social priming. Examples need to be different from those on the slides/class.

~~Social Priming After Coming~~

Emotional Priming: Person who experienced happiness recently looks at a neutral situation with a more +ve. outlook.

Social Priming: When we see "highly reordered" written on food items on online food ordering platforms we associate it with good in taste / quality.

11. Mohit has learned to associate his bed with studying and texting on his smartphone. Every time he lies in his bed, he has trouble falling asleep. In this example, identify the CS, US, CR, and UR.

conditioned stimulus (CS) = Bed.

unconditioned Stimulus (US) = studying and Texting.

Unconditioned Response (UR) = Staying Awake.

conditioned Response (CR) = Staying Awake.

12. A person successfully completes a habit-reversal program to stop biting their nails while at a remote treatment center. However, the moment they return to their high-stress office where the habit first formed, they immediately start biting their nails again. This behaviour is due to

RENEWAL OF CLASSICAL CONDITIONING DUE TO COMING BACK TO HIGH STRESS OFFICE CONTEXT AS THE HABIT WAS EXTINCT IN A CONTROLLED DIFFERENT ENVIRONMENT.

13. Give an example where positive and negative reinforcement can occur simultaneously.

A ~~person~~ child is made to sit in a noisy room with screeching noises, whenever he completes his/her food, the screeching sounds are stopped (negative reinforcement) and a toffee is given to the child (positive reinforcement).

good

14. Harry visited several coffee shops of the same brand last week that all look the same. He could clearly remember which specific shop made better coffee. This ability is an example of:

- A. Pattern completion – CA1 and dentate gyrus
- B. Pattern formation – CA1 and CA3
- C. Pattern extraction – Prefrontal cortex
- D. Pattern Separation - Dentate Gyrus and CA3

15. Patient A becomes scared every time he smells alcohol because it is immediately followed by an injection. However, Patient B never seems to be scared of the ~~alcohol~~. The nurse waits for a few minutes for the alcohol to dry before giving a specific injection to Patient B. Why might patient B not learn the association?

Due to lack of contiguity. The injection is temporally separated from alcohol in case of patient B, so B's mind did not learn the association. so it does not associate fear the alcohol as his/her mind does not fear it with injection.

16. A software user learns that a red flashing icon on their screen always precedes a system crash. The developers later add a loud beep that occurs at the exact same time as the red icon before a crash. During recent updates, the developers remove the red icon and play only the beep. What does the user expect the first time he hears only a beep?

- A) The beep gained saliency and therefore predicted the crash.
- B) The user expected no crash since the beep was overshadowed by the red icon
- C) The user expected no crash since both beep and red icon were not present
- D) The user expected a crash since the red icon had not lost its saliency.

17. A person is undergoing therapy to break a fast-food addiction. They spend hours sitting in a therapist's office looking at photos of burgers and fries without getting to eat them to "extinguish" the craving. Why might this therapy fail when the person leaves the office?

The craving to eat is associated with a lot of other cues like the place, friends with whom he/she eats, the smell of food. So even in the lab setting the person's brain might have learnt that seeing pictures does not lead to having fast food but in outside scenario this extinction might not have generalised so as soon as it goes in outside context there is a chance of renewal.

18. Which of these reinforcement schedules display persistent effort.

- A. Variable Interval
- B. Fixed Interval
- C. Fixed Ratio
- D. Variable Ratio

O.S