

PSYCHOLOGY

UNIT 3



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STAV House, 5 Munro Street,
Coburg VIC 3058 Australia

PHONE: 61 + 3 9385 3999
EMAIL: admin@stav.vic.edu.au
ABN: 59 004 145 329

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Use this page as an overlay for marking the multiple choice answer sheets. Simply photocopy the page onto an overhead projector sheet. The correct answers are open boxes below. Students should have shaded their answers. Therefore, any open box with shading inside it is correct and scores 1 mark.

	ONE ANSWER PER LINE		ONE ANSWER PER LINE		ONE ANSWER PER LINE
1	☒ ☐ ☒	15	☒ ☐ ☒	28	☐ ☒
2	☒ ☐ ☒	16	☒ ☐ ☒	29	☒ ☐ ☒
3	☐ ☒ ☒	17	☐ ☒ ☒	30	☐ ☒ ☒
4	☒ ☒ ☐	18	☒ ☐ ☒	31	☐ ☒ ☒
5	☐ ☒ ☒	19	☒ ☒ ☐	32	☒ ☐ ☒
6	☒ ☒ ☐	20	☒ ☒ ☐	33	☒ ☐ ☒
7	☒ ☐ ☒	21	☒ ☐ ☒	34	☒ ☒ ☐
8	☐ ☒ ☒	22	☒ ☒ ☐	35	☒ ☐ ☒
9	☒ ☒ ☐	23	☐ ☒ ☒	36	☒ ☐ ☒
10	☐ ☒ ☒	24	☒ ☒ ☐	37	☒ ☒ ☐
11	☒ ☐ ☒	25	☒ ☒ ☐	38	☐ ☒ ☒
12	☒ ☐ ☒	26	☒ ☐ ☒	39	☒ ☐ ☒
13	☐ ☒ ☒	27	☒ ☒ ☐	40	☒ ☐ ☒
14	☐ ☒ ☒				

SECTION A – Multiple-choice questions

1	B	15	C	28	A
2	C	16	B	29	B
3	A	17	A	30	A
4	D	18	B	31	A
5	A	19	D	32	C
6	D	20	D	33	C
7	C	21	B	34	D
8	A	22	D	35	B
9	D	23	A	36	C
10	A	24	D	37	D
11	C	25	D	38	A
12	B	26	C	39	C
13	A	27	D	40	B
14	A				

SECTION B**Question 1****a. Answer**

- As Jiang is learning to play the violin, glutamate (X) is released by the axon terminals of the presynaptic neuron (Y) into the synaptic gap.
- It will then bind to receptors on the postsynaptic dendrites (Z).
- As glutamate is an excitatory neurotransmitter it will make the post synaptic neuron more likely to fire.

3 marks Students identify all key structures and correctly explain the effect on the postsynaptic neuron with reference to Jiang.

2 marks Students make two of the above points.

1 mark Students make one of the above points.

b. Answer

- Two modifications that occur due to sprouting include dendritic branching and filigree appendages.
- Dendritic branching refers to bushier dendrites on the post-synaptic neuron that have more branches to make new connections.
- Filigree appendages refers to growth of axon terminal of the pre-synaptic neuron towards the dendrites of post synaptic neurons.

2 marks Students identify and explain both modifications correctly.

1 mark Students make one of the above points.

Question 2**Answer**

LTP and LTD:

- are both activity dependent
- both involve glutamate
- both occur at glutamate synapses
- both involve changes in excitability
- both have long-lasting effects
- are both forms of long-lasting neural plasticity

1 mark Students correctly identify any one of the above points.

Question 3**Answer**

- Neurotransmitters are chemical substances produced by a neuron; they carry messages from one neuron to another.
- For example, GABA. (*Note the question asked for inhibitory example*)
- Whereas neuromodulators are chemicals released by neurons that can have a modulatory effect – influencing the activity of multiple neurons.
- For example, dopamine or serotonin.
- Neurotransmitters affect a singular neuron and act quickly.
- Whereas neuromodulators can affect multiple neurons and act more slowly.

3 marks Students identify any two comparative statements and correctly provide examples of each.

2 marks Students make two of the above points without examples.

1 mark Students make one of the above points.

Question 4**a. Answer**

- The nervous system which is dominant during the audition in the sympathetic NS.

Any two of:

- Increased heart rate, breathing rate, blood pressure, which would provide Koray and Cindy's muscles with oxygenated blood more quickly, enabling them to move around on stage.
- Dilated pupils, which would increase the light entering their eyes and thus enabling them to see more clearly when on stage.
- Increased sweat production, which would act to cool them both down while performing on stage.
- Any other valid answer.

3 marks Students identify the nervous system and describe 2 adaptive changes.

2 marks Students make two of the above points.

1 mark Students make one of the above points.

b. Answer

- During primary appraisal Koray would need to evaluate the significance of the stressor (his ankle injury and upcoming audition) as either irrelevant, benign-positive, or stressful (harm/loss, threat or challenge).
- Koray likely considered the upcoming audition as 'benign positive' or a 'challenge' which can be overcome. He feels confident that they have both prepared well and thinks that some rest time might re-energise them both.

2 marks Students must apply the scenario and correctly identify the primary appraisal made.

1 mark Students make one of the above points.

c. Answer

- It is likely that Cindy is in the exhaustion stage of GAS as she has been in bed sick all week. Prolonged release of cortisol can impair the immune system, making her more susceptible to serious illness.
- It is likely that cortisol has been present in her bloodstream for a prolonged period and thus her body's resources appear depleted - Cindy is no longer able to cope.

2 marks Students must apply the scenario in their justification and correctly identify the GAS stage as exhaustion.

1 mark Students make one of the above points.

d. Answer

- Cortisol is initially released at the end of the countershock stage as the individual moves into the resistance stage. Cortisol is at its highest in the resistance stage.

One of:

- Cortisol would provide both Koray and Cindy additional energy, helping to increase their arousal and ability to confront the stressor of the audition.
- It could boost their energy levels by increasing blood glucose levels, enabling them to perform better during the audition or at rehearsals.
- It could heighten their alertness, increasing their brain's use of glucose so they can remember their dance routine.

2 marks Students must identify the initial release of cortisol and apply the scenario when explaining one positive effect of cortisol.

1 mark Students make one of the above points.

e. Answer

- The GAS model does not acknowledge the psychological or cognitive processing involved in Cindy's stress response, which could have affected the degree to which she experienced stress and thus she got sick.
- Cindy's stress response is more complicated than that of rats used in Selye's GAS model. Therefore, Selye's GAS model cannot be generalised to Cindy.
- The GAS model does not account for individual differences in Cindy's stress response.

1 mark Students make one of the above points.

Question 5**Answer**

- A coping strategy is considered to have context-specific effectiveness when it matches or is appropriate to the stressful situation.

Positive outcomes of exercise would be:

- While Travis waits for his test results, exercise could provide an opportunity for distraction and is therefore an effective avoidant coping strategy.
- Exercise can divert Travis's attention away from the negative emotional states associated with pending test results and thus is a good fit /has context specific effectiveness.
- Exercise increases the heart-rate and the rate of blood flow around the body; glucose and oxygen supply to the brain is therefore increased and cortisol concentration is reduced.

3 marks Students evaluate appropriately and correctly identify the coping strategy, referring to the context-specific effectiveness of exercise.

2 marks Students make two of the above points.

1 mark Students make one of the above points.

Question 6**Answer**

- The gut-brain axis is a bi-directional link between the central and enteric nervous systems. The gut communicates with the brain via the vagus nerve.
- Stress can disturb the balance of gut microbiota and the microbiota can influence susceptibility to stress and recovery from stress.

2 marks Students make both of the above points.

1 mark Students make one of the above points.

Question 7**Answer**

- Acute stress usually occurs because of a sudden threat that only lasts for a short time. whereas chronic stress involves a prolonged and constant feeling of stress.

OR

- Chronic stress tends to be less intense or severe than acute stress. However, recovering from chronic stress can take a lot longer, given the ongoing problems it can cause.

1 mark Students make one of the above points.

Question 8**a. Answer**

- The spinal reflex is an adaptive response as it increases survival or reduces further harm. Adaptive functions are those which protect an organism from potential harm.
- It is an unconscious response that does not initially involve the brain (involuntary response) thus acts faster and reduces harm.

1 mark Students make one of the above points.

b. Answer

Any example that illustrates the spinal reflex as an unconscious, involuntary and automatically occurring response without any initial input from the brain would be applicable. Response should include correct identification of pathways, neurons and withdrawal response. The following example may be useful:

- When sensory receptors in the foot / hand are stimulated by a sharp nail / hot stove a sensory neuron sends a message via afferent pathways up ascending tracts to the integrating centre in the spinal cord.
- The impulse synapses with an interneuron that connects / relays the message to a motor neuron to initiate an unconscious withdrawal response as well as synapsing through ascending afferent pathways to the brain.
- The motor neuron proceeds along efferent pathways down descending tracts to the effector muscles in the foot / hand.
- A fraction of a second later the brain receives and processes the impulse to consciously register the sensation and that the reflex has taken place.

3 marks	Students provide an example which correctly highlights the unconscious, involuntary nature of the spinal reflex and refer to correct terminology.
2 marks	Students make two of the above points.
1 mark	Students make one of the above points.

Question 9**a. Answer**

Students needed to include the following key points in the research hypothesis:

- the accurate IV (Memory technique used – Method of loci or indigenous memory technique)
- the correct identification of the DV (number of correctly recalled butterfly names)
- a clear direction – this direction could be higher / increased memory recall.

Example response:

- It is hypothesised that first year medical students who use the indigenous memory technique to memorise 20 butterfly names will have a higher level of memory recall of butterfly names, compared to those who use the method of loci technique.

3 marks	Students make all the above points.
2 marks	Students make two of the above points.
1 mark	Students make one of the above points.

b. Answer

- A mixed design was used in the study as there were three groups (between subject's design) who were all tested at 10 minute intervals (within subject's design).

1 mark	Students make the above point.
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c. Answer

The main advantage of the mixed design is that the researcher can capitalise on the strengths of both the between subjects design and the within subjects designs.

Any one of:

- Can test the effect of multiple independent variables on a dependent variable in one investigation.
- Testing multiple independent variables in one investigation can be time and cost effective compared to completing two or more separate investigations.
- Differences in participant variables are controlled in the within subject's design element.
- Fewer participants are needed for the experiment.

1 mark Students make one of the above points.

d. Answer

Accept any valid ethical consideration and brief explanation.

- **Voluntary participation:** the researchers must ensure that no coercion or pressure is put on the students to partake in the experiment and they freely choose to be involved in the study.
- **Confidentiality:** The privacy, protection, and security of the students involved in the study. Personal information / details and the anonymity of results should be ensured.
- **Informed consent procedures:** Ensure that participants understand the nature and purpose of the experiment, including potential risks, before agreeing to participate in the study.
- **Withdrawal rights:** The students / participants involved in the study can discontinue their involvement in the experiment at any time during the experiment, without penalty.

2 marks Students correctly name and explain one of the relevant ethical guidelines.

1 mark Students make one of the above points.

e. Answer

- long-term depression – use it or lose it principle.

1 mark Students make the above point.

f. Answer

Either one of:

- The students were all medical students which may mean superior memory ability or higher IQ which could elevate their results. To control for this, the researchers could use a more representative sample: include students from various faculties and / or use a sample of non-university students.
- Individual participant differences, some students may have better memory skills and if these students are unevenly distributed between conditions the results may be skewed, falsely suggesting one technique is better than another. To control for this prior testing could be completed and the students more evenly allocated to conditions.

2 marks Students include a response with both parts of the question accurately explained: the extraneous variable is identified and an explanation for how it is controlled is given.

1 mark Students identify the extraneous variable without an explanation for how it is controlled.

Question 10**a. Answer**

- Structure B is the Hippocampus.

Any one of:

- For those with Alzheimer's disease, neural degeneration occurs, meaning new explicit memories are not consolidated. Furthermore, recall of existing memories is reduced as the hippocampus is also involved in retrieval of explicit (semantic and episodic) information.
- Studies of patients with Alzheimer's disease have found significant impairments when they are asked to imagine novel experiences or asked to imagine the future or a hypothetical event or scenario.
- Therefore, the role of the hippocampus extends beyond retrieving episodic memory, it also encompasses imagining self-relevant future events and the construction of fictitious experiences.

2 marks Students identify structure B correctly and make one of the above points.

1 mark Students identify structure B only.

b. Answer

- Structure A – the amygdala

1 mark Students make the above point.

c. Answer

- Structure C is the cerebellum.

Two examples of implicit memories that might be encoded include:

- implicit procedural memories for motor skills, motor learning and the execution of voluntary movements
- encodes and temporarily stores implicit memories of simple conditioned reflexes acquired through classical conditioning

2 marks Students identify structure C correctly and make one of the above points.

1 mark Students identify structure C only.

Question 11**Answer**

The three-phase model of **operant conditioning** should be discussed.

- The antecedent (occurs before the behaviour) which was the mothers nagging. This led to
- The behaviour (occurs due to the antecedent) of cleaning her room and making her bed. This was done in order to avoid
- The consequence (constant nagging by her mother). This is an example of negative reinforcement, which involves the removal of an unpleasant stimulus (the nagging).
- It has the effect of increasing the likelihood of Sunita repeating the behaviour, thereby strengthening the response.

3 marks Students apply the three-phase model accurately and describe effect on behaviour. This includes identification of type of consequence / reinforcement.

2 marks Students make two of the above points.

1 mark Students make one of the above points.

Question 12**Answer**

- Sensory memory, which has an unlimited capacity (0.2 – 4 seconds) duration would initially receive information and momentarily store it in raw form.
- When we pay attention to the information, this would be encoded into STM, which has a limited capacity of 7 ± 2 pieces of information and a limited duration of 15 – 30 seconds.
- By rehearsing information, it undergoes further encoding into LTM. LTM has a potentially unlimited capacity and relatively permanent duration where semantic and episodic memories would be finally stored. For example, retrieval of the name of the first Prime Minister of Australia or memories of your last holiday would lead to information being sent from LTM to STM for it to be recalled.

3 marks Students explain the flow of information in memory formation and retrieval with reference to function, capacity, and duration of each store and demonstrate knowledge of the roles of short and long-term memory in forming and retrieving explicit long-term memories including examples.

2 marks Students make two of the above points.

1 mark Students make one of the above points.

END OF SUGGESTED SOLUTIONS

