Unit V - Answer Key

States of Consciousness

Module 22 - Understanding Consciousness and Hypnosis

While You Read

22-1

1. Consciousness is the subjective awareness of ourselves and our environment. Answers will vary
2. It would mean that they are happening outside of our awareness.

22-2

1. Highly hypnotizable people are those with the ability to focus attention totally on a task, to become imaginatively absorbed in it, and to entertain fanciful possibilities.
2. Hypnosis cannot be used to tap into a pure and complete memory bank—hypnotically refreshed memories combine fact with fiction. Hypnosis cannot force people to act against their will. Orne and Evans inserted a control group of pretend hypnotic patients into an experiment and showed that unhypnotized patients performed the same behaviors.
3. Hypnosis seems helpful for the treatment of obesity, but drug, alcohol, and smoking addictions have not responded well to hypnosis. Hypnosis can relieve pain—and can reduce fear. Hypnotized patients can require less medication and recover sooner and leave the hospital earlier. Nearly 10% of people can undergo major surgery while deeply hypnotized.

22-3

1. Like actors caught up in their roles, hypnotized subjects begin to feel and behave in ways appropriate for "good hypnotic subjects"—the more they like and trust the hypnotist, the more they allow that person to direct their attention and fantasies.
2. The Stroop Effect is a phenomenon that occurs when subjects are asked to identify the color of letters that form words. When those words are color words and in the same color as the word itself (ie. RED is colored red), the subjects are easily able to identify color. It gets trickier when RED is colored green. While hypnotized and given a suggestion to focus on the color and see the letters as gibberish, they were much less slowed by the word-color conflict.
3. Ernest Hilgard proposed the idea of the dissociation, that some thoughts occur simultaneously with others. Hilgard also had hypnotized people lower their arm into an ice bath, and found that the hypnosis dissociated the sensation of the pain stimulus from the emotional suffering that defined their experience of pain. Hypnosis divided their consciousness so that they could feel the cold, but not the pain.
4. A form of dual processing, selective attention may play a role in hypnotic pain relief. Hypnosis reduces brain activity in the region that processes painful stimuli but not in the sensory cortex, which receives the raw sensory input—the attention to the stimuli is blocked until we direct our attention to it (after the game).

After You Read

Module 22 Review

1. **d.** dissociation.
2. **e.** stream of consciousness.
3. Because hypnosis cannot help us remember past events, she will give an account that either repeats information from the hypnotist's questions or is a combination of truth and fiction.
4. If Dr. Choi, a psychologist, wanted to help one of his patients reduce his overeating behaviors and get control of his obesity, he might use hypnosis in the therapy session to offer a posthypnotic suggestion that would be carried out after his patient was no longer hypnotized.
5. When asked to read the word "BLUE" with letters colored in green many people find they take longer than if the letters were colored in blue. This phenomenon is referred to as the Stroop effect.

Module 23 - Sleep Patterns and Sleep Theories

While You Read

23-1

1. Even when we are asleep we are aware of our surroundings- we do not fall out of bed and we process auditory and other stimuli.

23-2

1. Circadian rhythm is an internal biological clock that synchronizes somewhat with the 24-hour clock. The timeline below should show alertness and body temperature rising around 6 a.m., peaking around 1 or 2 p.m., dipping in early afternoon (3/4), rising again in evening, and dipping back down as night sets in.
2. Some studies suggest that teens and young adults have slightly later circadian rhythm patterns, than adults. This explains why adults are tired and go to sleep earlier than many teens.
3. Answers will vary

23-3

1.

Stage	**Wave Name**	**Wave Characteristics**	**Characteristics or Common Behaviors of This Stage**
Awake but relaxed	alpha	high frequency	• alert and aware but crossing slowly into the first stage of sleep
NREM-1	theta	slower frequency than alpha	• fantastic images resembling hallucinations • hypnagogic sensations such as the jerk of a limb or feeling of falling • sensations from the environment filter in to the images
NREM-2	-	sleep spindles—rapid bursts of rhythmic brain-wave activity	• could be awakened without much difficulty but now clearly asleep
NREM-3	delta	slower frequency waves that last about 30 minutes	• harder to wake—deepest level of NREM sleep

REM	-	waves become rapid and saw-toothed like those of NREM-1	• heart rate rises, breathing becomes rapid and irregular, eyes dart, dreaming occurs

2. Older adults have more awakenings.

Younger adults have more REM time during the sleep time.

Young adults have more periods of deep sleep than older adults.

3. As the sleep period progresses, less time is spent in NREM-3 and more time is spent in REM.

4. The brain is active but the muscles are relaxed. There is high nervous system activity but the body is essentially paralyzed. In addition, REM sleep is "bookended" by light levels of sleep, NREM-1 or NREM-2, yet is the deepest sleep.

23-4

1. Not everyone needs 8 hours—newborns spend 2/3 of their day sleeping, most adults no more than 1/3. Some of us thrive on 6; others really need 9 hours.

2. In countries with electric lighting, shift work, electronic devices, and social media/TV, those who would have gone to bed at 9 p.m. are now up until 11 p.m or later. Our environment has caused us to sleep less than we would have a century ago; there is also a role in parent-set bedtimes, the text mentions Australian teens get more sleep than American teens.

3. Bright morning light tweaks the circadian clock by activating light-sensitive retinal proteins. These proteins signal the SCN, which causes the brain's pineal gland to decrease its production of the sleep-inducing hormone melatonin in the morning, and to increase it in the evening.

4. Being bathed in artificial light disrupts our circadian rhythm. It sends miscues to the SCN to continue to inhibit the release of melatonin, thus keeping us awake when we really should be sleeping.

23-5

1. Evolutionary psychologists would hold this view. Because we have limited abilities at night compared with nocturnal species, it would make more survival sense for us to hunker down in a cave and sleep when we are most vulnerable. Those who didn't try to navigate at night were more likely to leave descendants.
2. Biological psychology takes this view. Helping restore and repair brain tissue and ridding the body of free radicals and other toxins helps us to restart the next day in a better physical shape.
3. Cognitive psychology takes this view. Strengthening memory and making neural connections to material learned is key to learning. More sleep leads to better memory of recently learned materials.
4. Well-rested athletes have faster reaction times, more energy, and greater endurance. Slow-wave sleep, which occurs mostly in the first half of the sleep phase, is essential for producing the human growth hormone that helps develop muscles.

After You Read

Module 23 Review

1. **a.** in NREM-1 sleep.
2. **c.** sleep spindles
3. Justin's natural biological circadian rhythm dips during the early afternoon. His body temperature and alertness levels decline and he may feel tired. Many cultures embrace this natural rhythm and close shops and take a siesta at this time.
4. **c.** suprachiasmatic nucleus (SCN).
5. **c.** REM
6. **d.** time spent in REM sleep will increase.
7. **d.** REM

Module 24 - Sleep Deprivation, Sleep Disorders, and Dreams

While You Read

24-1

1.

a. Sleep deprivation is responsible for difficulty studying, diminished productivity, tendency to make mistakes, irritability, fatigue

b. Increases in ghrelin, a hunger-arousing hormone, and decreases in leptin, a hunger-suppressing hormone, cause weight gain and make us more vulnerable to obesity.

c. Sleep deprivation suppresses immune cells that fight off viral infections and cancer, and affects longevity—those who sleep less do not live as long.

d. Sleep deprivation causes increased errors on attention tasks (screening baggage, performing surgery, reading X-rays, etc.).

2.

a. After a time change, loss of just one hour of sleep was correlated with an increase in auto accidents.

b. By reading the numbers to the left in the graph you can see that while there is an increase from Monday to Monday when an hour of sleep is lost there are actually roughly 1000 more accidents the Monday after the hour of sleep is gained.

3.

a. Symptoms involve recurring problems in falling or staying asleep. 1 in 10 adults and 1 in 4 older adults suffer from insomnia.

b. Symptoms include uncontrollable and sudden attacks of overwhelming sleepiness, usually lasting less than 5 minutes. The person usually collapses directly into a brief period of REM sleep, with loss of muscular tension. Occurs in 1 in 2000 people.

c. Symptoms are temporary cessations of breathing during sleep and repeated momentary awakenings. Sleep apnea occurs in 1 in 20 people.

d. Symptoms involve high arousal and an appearance of being terrified, occurring in NREM-3 sleep, within 2 to 3 hours of falling asleep. Night terrors occur mostly in children.

e. Sleepwalking is an NREM-3 sleep disorder that runs in families. Occurs mostly in children. About 20% of 3- to 12-year-olds have at least one episode; 5% have repeat episodes. Sleeptalking is an NREM-3 sleep disorder of nonsensical or garbled speech that occurs mostly in children.

4. Night terrors occur during NREM-3 sleep. Nightmares occur during early morning REM sleep.

24-2

1. The story line of dreams incorporates traces of previous days' experiences and preoccupations:

After suffering a trauma, people commonly report nightmares. Americans reported an increase in threatening dreams following the attacks of September 11, 2001.

Compared with nonmusicians, musicians report twice as many dreams of music.

People who 'consume violent media' tend to have violent dreams

In a classic experiment, researchers lightly sprayed cold water on dreamers faces and they were more likely to dream about a waterfall, leaky roof, or being sprayed by someone.

2. We do not remember recorded information played while we are soundly asleep. Anything that happens during the 5 minutes just before we fall asleep is typically lost from memory.
3. Freud theorized that dreams were the unconscious' attempts to fulfill wishes or satisfy urges that are not acceptable in waking life—taboo urges such as those of a sexual or violent nature. Instead, to diffuse the conflict of wanting these things but not being able to express them, the dream serves as an outlet for the building pressure. The manifest content of the dream allows the more taboo items (the latent content) to surface in a non-threatening way.
4. This perspective proposes that dreams may help sift, sort, and fix the day's experiences in our memory. When tested the day after learning a task, those deprived of both slow-wave and REM sleep did not do as well on their learning as those who slept undisturbed.
5. The brain regions that are activated as rats learn to navigate a maze or as people learn to perform a visual-discrimination task are the same ones that activate again during REM sleep.
6. Current research suggests that sleep and REM are essential to cognitive processing. The consolidating of material learned throughout the day happens at night when we sleep. Students in high school with higher grades report averaging 25 more minutes of sleep a night. (Obviously this is correlational— students with high grades also report more parent involvement, better nutrition, more academic role models, more emphasis placed on academics, and so forth.)
7. Perhaps dreams or the brain activity associated with REM sleep provide the brain with periodic stimulation, which preserves and expands the brain's neural pathways.

8. Dreams are the brain's attempt to make sense of random neural activity. Internal stimuli activate brain areas that process visual images. Dreams of falling or flying may be the weaving of neural impulses firing in the cerebellum.
9. Cognitive psychologists may view dreaming as part of brain maturation and cognitive development. Unlike the idea that dreams originate from bottom-up brain activation, this perspective emphasizes our mind's top-down control of our dream content.
10. Answers will vary.
11. Most other mammals experience REM rebound as well.

After You Read

Module 24 Review

1. **d.** have trouble falling or remaining asleep.
2. **c.** a sleepwalking disorder.
3. **d.** sleep apnea.
4. **e.** narcolepsy.
5. **a.** primarily experienced this during her NREM-3 sleep.
6. Any of the images in Justina's dream may be symbolic masks of what she is really dreaming about. She may have unacceptable feelings for her teacher or school in general and she is setting up this aggressive battle scene to work through those feelings.
7. Justina's day may have consisted of a very challenging geometry test or a history unit on Medieval times, and this dreamscape is helping her to sort out the day's events or consolidate her memory of new theorems. Or perhaps Ms. Hargroves simply passed Justina in the hall today and then showed up as a guest in her dream.

8. This theory does not explain why we experience meaningful dreams. Regular brain stimulation from REM sleep is currently helping to develop and preserve neural pathways.
9. The story Justina is creating is a weaving of neural information her brain is emitting. Perhaps her amygdala, the seat of intense fear and emotional responses in her limbic system, is activated, so she is creating this tense, fear-filled threatening dreamscape.

   Other answers that involve brain structures and neural activity might work as well.
10. Justina's dream reflects her cognitive development—her knowledge and understanding. Justina's dream is engaging and features her as an actor; there is coherent speech and an active story line that draws on her concepts and knowledge. It is reflective of her maturing cognitions.

Module 25 - Psychoactive Drugs

While You Read

25-1

1. Most adults use caffeine, nicotine, alcohol and a variety of prescribed drugs each day, usually in moderation and without disrupting their lives.

25-2

1. When a person continues to use drugs, he or she develops a tolerance in which brain chemistry adapts to offset the drug effect; to experience the same effect, the user requires larger and larger doses which may lead to addiction, a craving for the drug despite the consequences. When the user abruptly stops using the drug, withdrawal side effects such as pain, headaches, and tremors may send the user back to the drug for relief.
2. The term *addiction* is now extended to cover behaviors formally considered bad habits or sins—for example, eating, working and sex. Despite this, we are just now learning more about the mechanisms of addiction and exploring the effect on brain structures of certain neurotransmitters that play a role in addiction. Particularly in the realm of social media—Internet behaviors, video gaming, —and such—many people seem unable to regulate their use of these distractors even to the risk of their family or work.
3. The progression from drug use to a substance use disorder occurs due to tolerance—needing more and more of the drug to achieve the same effect. A disorder occurs once this behavior has become socially or occupationally disruptive and the person feels unable to cease the drug-taking behavior.

25-3

1. Depressants are drugs that reduce neural activity and slow body functions.

Three examples are alcohol, barbiturates, and opiates (specific types and names may be used instead).

2. Effects include slow brain activity that leads to impaired judgment and inhibitions.

3.

a. Low doses of a depressant slow sympathetic nervous system activity; larger doses slow reactions and performance as well as slurring speech.

b. Alcohol disrupts memory formation, and heavy drinking can have long-term effects on the brain. Alcohol causes blackouts by suppressing REM sleep so the brain is unable to fix the day's experiences into memory.

c. Alcohol causes increased mind-wandering and causes people to be less likely to notice that they zoned out.

Alcohol reduces self-awareness and focuses attention on an arousing situation, distracting attention from normal inhibitions and future consequences.

4. When people believe they have been drinking alcohol but haven't, they will behave as if they have (placebo effect).

5. Three common opiates are heroin, codeine and morphine: Pupils constrict, breathing slows, lethargy sets in, and blissful pleasure replaces pain and anxiety. Eventually, the brain stops producing endorphins.

6. The body reduces its secretion of natural opiates, because it senses that the body has sufficient pain-relieving chemicals already. When the artificial opiate is withdrawn or wears

off, the brain's own pain relievers are not at levels high enough to suppress the pain and the user reaches for more and stronger drugs.

25-4

1. Stimulants are drugs that excite neural activity and speed up body functions. Examples are caffeine, nicotine, amphetamines, cocaine, methamphetamine, and Ecstasy.
2. Pupils dilate, heart and breathing rates increase, blood sugar levels rise, appetite lessens, and energy and self-confidence rise.
3. Within seconds, a rush of nicotine signals the CNS to release a flood of neurotransmitters—epinephrine and norepinephrine diminish appetite and boost alertness and mental efficiency, and dopamine and opioids calm anxiety and reduce sensitivity to pain.
4. Answers will vary.
5. Cocaine blocks the receptor sites that allow for reuptake of dopamine, norepinephrine, and serotonin. This keeps them in the synapse longer and intensifies their mood-altering effects.
6. It may lead to emotional disturbances, suspiciousness, convulsions, cardiac arrest, or respiratory failure.
7. Given a placebo, cocaine users who thought they were taking cocaine often had a cocaine-like experience.
8. It triggers the release of dopamine, which stimulates brain cells that enhance energy and mood, leading to heightened energy and euphoria.
9. It triggers dopamine release, like a stimulant, but it also blocks the reuptake of serotonin which causes psychological emotional elevation and social connectedness.

10. It can damage serotonin-producing neurons, leading to an increased risk of a permanently depressed mood. It also suppresses the immune system, impairs memory, slows thought, and disrupts sleep.

25-5

1. Hallucinogens are psychedelic drugs that distort perceptions and evoke sensory images in the absence of sensory input.

Examples include LSD and marijuana.

2. Primarily, hallucinogen use distorts perceptions of time and space.

3. LSD use is associated with emotions varying from euphoria to detachment to panic, and imagery, including geometric forms, meaningful images superimposed on a tunnel, and dreamlike scenes; the creator of LSD described his experience as "an uninterrupted stream of fantastic pictures, extraordinary shapes with intense, kaleidoscopic play of colors…a miraculous, powerful, unfathomable reality."

4. The sensations experienced under LSD use are like those of the bright lights, replaying of old memories, and out-of-body experiences reported by those who suffered near-death experiences or seizures, for example. In each of these near-death situations, the brain is stressed and oxygen-deprived and produces these images. Perhaps the use of LSD is that dangerous to make the brain believe it is dying and that is why users report these same images.

5. Marijuana use disrupts memory formation and interferes with immediate recall of information learned only a few moments before.

6. The body eliminates alcohol within hours; THC lingers in the body for a week or more, which means users experience less abrupt withdrawal.
7. Marijuana use is being decriminalized for medical reasons to relieve the pain and nausea associated with AIDS, glaucoma, and cancer.

Answers will vary.

After You Read

Module 25 Review

1.

Drug	Category	Effect on CNS	Behavioral Impact
Alcohol	Depressant	slows	memory loss, errors in judgment and decision making, increase in impulsive behaviors
Caffeine	Stimulant	speeds	increases alertness, energy, shakes or tremors, restlessness
Methamphetamine	Stimulant	speeds	euphoria, alertness, energy, irritability
Nicotine	Stimulant	speeds	arousal, relaxation, reduction of stress
LSD	Hallucinogen	[N/A]	hallucinations
Heroin	Depressant	slows	pain relief
Barbiturate	Depressant	slows	pain relief, induces sleep, reduces anxiety

Cocaine	Stimulant	speeds	alertness and energy, increases aggression
Marijuana	Hallucinogen	has some depressive qualities	relaxes, disinhibits, euphoric high, increases appetite, memory disruption, agitation, hallucinations, impairs motor coordination and perceptual skills
Ecstasy	Stimulant	speeds	high energy, emotional elevation, connectedness with those around them, dehydration, permanently depressed mood

2. **c.** An opiate

3. **e.** In small doses it is a depressant; in large doses it is a depressant.

4. **d.** Reduced circulation to extremities

5. **a.** Ecstasy.

✓ Check Yourself

Disorder	Behaviors I Would Expect	Patient Exhibits (✓)
Insomnia	persistent problems in falling or staying asleep	
Narcolepsy	sudden attacks of overwhelming sleepiness, usually lasting less than 5 minutes	

Sleep apnea	feelings of fatigue and depression during the day, perhaps obesity, loud snoring, daytime irritability, and possibly high blood pressure	
Night terrors	sitting or walking around during sleep, talking incoherently, doubled heart and breathing rates, terror	
Drug Use Category	**Behaviors I Would Expect**	**Patient Exhibits (✓)**
Stimulant	increased alertness, anxiety, restlessness, perhaps insomnia, rush of euphoria, confidence and energy, cardiovascular stress, suspiciousness	
Depressant	depression, memory loss, organ damage, impaired reactions	
Hallucinogen	enhanced sensations, relief of pain, distortion of time and space, impaired learning and memory, increased risk of psychological disorders, lung damage	

There could be several correct “diagnoses” in this scenario, depending on the drug effects and sleep disorder effects the student highlights.

The diagnosis should show supporting information from the chart. For instance, a diagnosis of sleep apnea would be correct if the student references the agitation and fatigue the patient experiences at work.