Brain Case Studies Assignment

Using your vast knowledge of the amazing human brain, answer the questions that follow each of the cases.

No, you DO NOT need to use complete sentences.
Please DO NOT write lengthy responses. Short and sweet is fine!!

Case 1

It was very dark as Carol walked home from the library. She was thinking about tomorrow's test when she heard heavy breathing and then felt a strong hand on her shoulder. She turned and stared into the terrifying eyes of a huge man holding a chainsaw. Without thinking, she swung her book bag with all her might, hit the enormous man in his stomach, knocked out his breath, and saw him double over. Carol ran home faster than she had ever run before. Her roommate couldn't believe that 5- foot- 1, 98- pound Carol had the strength to knock out the man's breath and speed on home. When Carol first got home, her heart was pounding, her breathing was rapid, her nerves were on edge, she was sweating, and her mouth was dry. It was not until several hours later that Carol had calmed down enough to go to sleep.

1. Which part of Carol's nervous system gave her the "get up and go" and the strength to knock out the man's breath and run home faster than the wind? (note this is NOT asking for a part of the brain, but a part of the Nervous System)

2. Which part of Carol's nervous system helped calm down her body? (note this is NOT asking for a part of the brain, but a part of the Nervous System)

3. What other things does your answer to Question 1 do?

4. What other things does your answer to Question 2 do?

Case 2

It was Saturday night and Mark had drunk too many beers. He was standing on the second floor balcony, loudly boasting that he was going to do a swan dive into the swimming pool. Everybody told him not to dive because he was too drunk and the pool was too shallow. Mark wouldn't listen because he wanted to show off to the new coed. Shouting, "Look at me," he jumped into the pool. He struck his head on the bottom and broke his neck. Although he survived the accident, Mark cannot move any parts of his body or feel any sensations from his shoulders down. However, all his other sensory and motor functions from the shoulders up are completely normal.

1. Why doesn't Mark have any sensations below his shoulders?

2. Why can't Mark move any of his muscles below his shoulders?
Case 3

It was Friday the 13th and Janice was being especially careful as she walked down a busy downtown street. While she was stepping out on the street to avoid a construction ladder, leaping over a large crack in the pavement and shielding her eyes from a big black stray cat, she was hit by a city bus. The paramedics arrived to find Janice unconscious and not breathing. They immediately gave her CPR and tried mouth-to-mouth resuscitation but Janice did not start breathing. Just as the big black cat walked slowly by, the paramedic said, "I bet her ______ was damaged and that's why she stopped breathing."

1. Which part of Janice's brain regulates breathing and was damaged?

2. Where is the above brain part located?

3. What are the functions of this brain part (besides breathing)?

Case 4

John is the kind of person who must have at least eight hours of sleep every night. If he doesn't get his eight hours, he is cranky, irritable, and a pain in the neck. However, during the last month something unusual has happened to John. He has gone from his usual eight hours a night to only three hours a night. Although now he has more time for work and play, he became worried about sleeping only three hours when all his friends asked him, "What's wrong with you?" John thought it might be some hidden psychological problem so he went to a therapist, but that didn't help. Next John went to his family doctor who prescribed sleeping pills but that didn't help either. Finally, John went to a neurologist who did a brain scan. The neurologist told John that he has a brain tumor. The tumor is affecting part of his brain called the ______, which is involved in the regulation of sleep.

1. Which part of John's brain is being affected by the tumor and interfering with his sleep?

2. Where is this brain part located?

Case 5

Here's a real horror story. There is a tiny bug that lives under beds and comes out at night when a person is sound asleep. The bug crawls into the person's ear and keeps on going until it reaches the brain. Very quietly so as not to wake the person, the bug
begins to eat away its favorite part of the person's brain. The next morning, as the person gets up, he or she walks to the bathroom in a very clumsy way. The person has no trouble holding the toothbrush but has great difficulty making smooth, circular brushing strokes. At lunch time, the person has no trouble holding a quarter but has great trouble making the fine movements needed to put the quarter into the vending machine's slot. Throughout the day, the person has no trouble starting movements but has difficulty making smooth movements and walks as if drunk.

1. Which part of the person's brain did the tiny bug eat away?

2. What is the function of the above brain part?

Case 6

At eight o'clock on a Saturday night in Las Vegas, Bruno was waiting in the big hall and heard the crowd cheer when his name was announced. He walked down the aisle, climbed into the ring, and raised his gloved hands to greet the crowd. For about two hours of his time, Bruno was going to be paid five million dollars. Bruno had earned a reputation as being fast and strong and was likely to be the next heavyweight boxing champion. In the first two rounds, his punches matched his reputation. In the middle of the third round, Bruno caught an unexpected vicious punch that snapped back his head. Before he knew what hit him, Bruno was lying on the mat, unconscious. Bruno never regained consciousness and remained in a coma. Now, many months later, Bruno's chances of coming out of the coma are very small, because one part of his brain was damaged by the knockout punch.

1. What part of Bruno's brain did the knockout punch damage?

2. What is the function of this brain part?

3. Where is it located?

Case 7

Bruno, who is in a coma, is kept alive by a life support system that includes a respirator to control his breathing and another machine to supply food and fluids. Bruno's brain wave pattern is flat, which means that he is brain dead or that his forebrain is not functioning. The doctors tell Bruno's mother that Bruno is in a vegetative coma from which he is most unlikely to ever come out. Being in a vegetative coma means that Bruno can make no response that we associate with being human—speaking, thinking, responding to questions. On the advice of the doctors, Bruno's mother decides that it would be best if the respirator were disconnected and Bruno be allowed to die without pain. The doctors disconnect Bruno's respirator and the room was very quiet for several
minutes. Then Bruno gasped for air and began to breath on his own. The doctors explain that in a few cases such as Bruno's, when the respirator is turned off, a small part of the brain can keep a person alive but the rest of the brain is dead.

1. Which part of Bruno's brain is keeping him alive?

Case 8

Although Michelle is usually smiley and happy, some very weird things have happened to her this week that caused her to be a little concerned. On Monday, she was sitting in her art class watching a video when she suddenly could not see and discovered that she was completely blind. On Tuesday, she was practicing the violin when she realized that she could not hear anything and was totally deaf. On Wednesday, now blind and deaf, she was in the cafeteria eating a pizza when she realized that she could not taste anything and had lost all sense of taste. By Thursday Michelle was getting a little concerned about how her life was going and what could happen next. She pinched herself to make sure that she was all right but discovered that couldn't feel a thing. In just four days, she had lost her ability to see, hear, taste, and touch. She remembered having some really bad weeks but nothing like this one.

1. What part of Michelle's brain was being destroyed by a tumor?

2. What is the function of this brain part?

Case 9

Harry was always one to accept a dare and this dare seemed like fun. All he had to do was put on a pair of roller skates and skate backward 100 feet. Harry had not been on skates since he was ten but was confident he could remember. He put on the skates, stood up, and took the first tentative steps. He was moving forward OK but now came the hard part- turning 180 degrees and skating backward. He tried to twist his body and turn his feet but everything got tangled up and he fell over backwards with his head hitting the concrete with a loud thud. When Harry slowly sat up, he rubbed his head and wondered why he was seeing stars.

1. Why did Harry see stars when his head hit the concrete?

2. What part of the brain was damaged?

3. What would happen to Harry if the fall destroyed his entire lobe?
Case 10

Susie was a very healthy, happy baby except that she was born deaf. She had no other sensory or motor problems. When Susie was 18 years old, a neurosurgeon discussed her having a new but experimental brain operation. During this operation, tiny holes would be drilled into her skull, and then very tiny wires would be implanted into certain parts of her brain. The neurosurgeon explained that these tiny wires would be connected to a stimulator. When the stimulator was turned on, an electrical current flowed through the wires and stimulated the brain cells or neurons at the ends of the wires. Susie agreed to have the surgery, which was successful. After a two week recovery period, the wires were connected to a stimulator. The stimulator was turned on, and what happened next brought tears to Susie's eyes. For the first time in her life, she heard sounds.

1. In which lobe of Susie's brain were the tiny wires implanted?

Case 11

Patti's goal is to be a terrific figure skater and compete in the next Winter Olympics. For the next four years, Patti must practice 4-6 hours every day, watch her weight, eat right, and get as much sleep as she can. During one of her practice sessions, she was doing a spectacular double whirl, spin, and leap when she caught an edge. She happened to fall down in the path of an oncoming speed skater, who was going too fast to avoid her. The speed skater's skate passed over one side of Patti's skull and damaged the right side of her brain. When Patti tried to get up and walk, she discovered that the right side of her body moved normally but that her left leg and left arm were paralyzed. But when someone grabbed her left arm and leg to help her up, she realized that she had no problem feeling hands touching her left leg and left arm.

1. First, which area (part) of Patti's brain was damaged?

2. In which lobe is this area located?

Case 12

You're from out of town, not knowing anyone at the college, you decide to live on campus. You're assigned a roommate and are eager to meet him and get settled. When you enter your shared room, you find that Harry, your new roomy, has scattered his things all over the floor, beds, desks, and chairs. When you ask Harry to clean up the mess, he gets incredibly angry and yells, "Go to hell!" The next minute he is smiling and saying, "I'm sorry; I'll clean it up." You watch as Harry picks up his things and moves them around the room but can't figure out how to organize his things. You're really mad now and shout. "Get this stuff cleaned up NOW or you're out of here!" To your surprise, Harry starts to cry and explains that he cannot seem to plan and organize or
get things done right. He says that people don't understand him and just holler at him. Just then, Harry's father walks in and explains that when Harry was a youngster, part of his brain was damaged.

1. Which part of Harry's brain had been damaged?

2. Can you name two behaviors that the lobe is involved in?

Case 13

Sharon has never told anyone her most secret fear. She's terrified that she is part because of the strange things that happen to her. Sometimes she has terrible sexual desires that she can just barely restrain. Sometimes she goes from restaurant to restaurant and eats 4-8 meals a day. Sometimes she goes to a water fountain and drinks water for 15 minutes straight. Sometimes she feels tremendous love for her boyfriend and then, without warning, hates his guts. Sometimes she is happy and then suddenly becomes angry. There is a tumor growing in Sharon's brain that is causing all these strange behaviors.

1. Where is the tumor growing in Sharon's brain?

2. Can you name three behaviors regulated by the part?

3. Can you name the evolutionarily very old brain system of which this brain part is part of?

Case 14

Sam was getting off an elevator when he dropped an important folder. As he reached down to pick it up, the elevator doors closed and squeezed his head between them. Ever since the elevator door accident, Sam has not been the same. For example, he goes to the same video store several times a week and always hands the clerk the same beat-up note with one word on it, Batman. The clerk always asks, "Have you ever seen Batman before?" Sam always shakes his head and replies, "No, it's the first time. Is it any good?" The clerk always replies, "It's really great. You'll love it." So far, Sam has rented Batman 74 times and can't remember ever having seen it. Although Sam can't remember ever seeing Batman, he has no sensory motor problems.

1. Which part of Sam's brain was damaged, causing this particular kind of memory problem?

2. What is the function of this part of the brain?
Case 15

Just before the world-famous dancer Agnes DeMille was to perform on stage, she felt an incredible pain in her head and then lost consciousness. She woke up in an ambulance that was taking her to the emergency room. She looked around and was able to ask, "What's happened to me? The paramedic answered, "I think you've had a stroke. Just lie quietly until the neurologist has a chance to examine you." Agnes did have a stroke, which permanently changed her behavior. She could never dance again because she could not feel where her right foot or right hand were and could not feel if someone touched them. However, she had no difficulty moving her right hand or right foot.

1. Can you name the area in Agnes' brain that the stroke damaged?
2. In which lobe is the area located?
3. On which side did the damage occur?

Case 16

Each time Dave talked, people laughed and said that he had one of the best comedy routines that they had ever heard. Dave would begin with what seemed like a normal sentence but after a few words he would start talking about an entirely different topic, and after a few more words he would go off on another area. The result was that Dave never seemed to finish a sentence or make any sense but he talked in a very fluent manner. For example, Dave might sound like this: "Like, it's all sunny, cause books cost a lot, and there's no reason for a car, and don't buy shoes, and I like hamburgers on sale except in bad times." The reason that Dave talks like this is because he had a certain part of his brain damaged.

1. Which area of Dave's brain was damaged and caused him to speak in a fluent way but make no sense?
2. In which lobe is this area located?

Case 17

From the time that she was a little girl, Marci had epileptic seizures. However, when she was young, the seizures occurred infrequently because they were controlled by drugs. As she grew older, the seizures became worse and the drugs no longer worked. By the time she was 21, she was having five to six major seizures a day. During a major seizure, Marci would fall to the floor, become unconscious, and her arms and legs would move in violent spastic motions. Many times her limbs were sprained and bruised. After the seizure, she would have no memory of what happened, and she
usually felt very drowsy. Because the seizures were so frequent and so bad and drugs did not work, she chose to have a radical brain surgery called a split brain operation. After the split brain operation, Marci’s seizures were greatly reduced.

1. What party of Marci’s brain did the neurosurgeon cut to produce a split brain?

2. What is the function of the part that was cut?

3. Which hemisphere of the brain has superior language skills?

4. Which hemisphere of the brain has superior mathematical skills?

5. Which hemisphere of the brain is better at recognizing faces?

Case 18

Marci, whose speech area is in her left hemisphere, appears and behaves relatively normal after her split brain operation. She can carry on a normal conversation, read a book, dress herself, drive a car, and do hundreds of other things. In fact, if you met Marci, you would have a very difficult time telling that she had a split brain operation. However, when she is given special tests, it becomes very clear that her left and right hemispheres are not communicating. For example, suppose we show a photo of a dog to only her right hemisphere, and we ask Marci, "What did you see?"

1. How can Marci identify what her right hemisphere saw?

Case 19

Marci, who you know has a split brain, is asked to do another task. She is blindfolded and told to reach into a bag with her right hand and select any one of the four objects in the bag. The bag contains a pencil, ball, triangle, and a small box. Marci reaches into the bag with her right hand, and after feeling the four objects, grabs the ball. Without looking at the object, Marci is asked to remember the object she holds in her right hand. Then she is told to withdraw her hand and leave the object in the bag. Now Marci’s blindfold is removed.

1. How can Marci, who has taken her right hand out of the bag, identify the object?
Case 20

You and your grandmother, who is 83 years old, were talking about how you're doing in school. Suddenly she stopped talking and said that something strange was going on in her head. When the doctor examined grandmother, he explained that she had had a stroke. A stroke means that one of the arteries in her brain became blocked. As a result, part of her brain was damaged by lack of blood and oxygen. The stroke affected granny's ability to speak. The good news is that she will be able to understand most of what is spoken to her. The bad news is that she will not be able to speak in a fluent fashion. Instead, her speech pattern will be very broken. Before the stroke, granny could say, "I need to go to the grocery store and by several cans of chicken soup and see if the lettuce is fresh". After the stroke, granny can only say, "Go store, buy soup, see lettuce."

1. Which part of granny's brain was damaged and caused her to speak in a broken, halting manner but did not interfere with her understanding of what was said?

2. In which lobe of the brain is this part located?