Fate of the less fortune

Student name

[Institutional Affiliation(s)]

**Session 1**

***Cardiovascular system***

Blood through the pulmonic valves into the atrium (called pulmonary artery) and then flows to the lungs then into the left atrium. Blood flows firm left to the right atrium through the open mitral.

***Respiratory system***

There are different types of gaseous exchange between in respiration i.e. ventilation, internal, external and cellular respiration, but all these processes are different from each other. Exchange of air that takes place between the atmosphere and lungs. It is the movement of a volume of gas in and out of the lungs. Particularly the exchange of oxygen and carbon dioxide that takes place in alveoli. It is the process in which oxygen diffuses from blood in both interstitial fluid and cells. It is the process of exchange of gases (oxygen and carbon dioxide) which takes place between gills, lings and external atmosphere. Cellular respiration is one of the

**Session 2**

***Step by the step digestion process***

* The process of digestion consists of a series of step by step reaction of food and digestive hormones. It starts right from the oral cavity as it is important to break down the food into simpler components in the mouth so that they could be easily absorbed in body cells. When one eats food start moving and food is pushed back towards the throat. A small flap called the epiglottis covers the windpipe. Saliva is the main enzyme used in chewing.
* Next food moves into the esophagus and the process becomes automatic after food is swallowed, the brain sends a message to the esophagus muscles (Shortt et al, 2019).
* At the end of the esophagus, sphincter (a ring-like muscle) is present that relax and let the food pass into the stomach. The same organ stays close so that the flowing back of food could be stopped.
* The stomach is the main organ in which digestion takes place and in this part, food is mixed with digestive juices. After the initial digestion, chime goes to the small intestine. Stomach acid is the main enzyme used for digestion in this part.
* Small intestine muscle mix food with juice coming from the pancreas intestine and liver. It is the stage where the mixture is sent for further digestion. The walls of the small intestine absorb water and digested nutrients are sent to the bloodstream and the next digestive process passes to the large intestine. Digestive juices include bile and pancreatic juice in this part.
* In the large intestine, undigested food is separated and the large intestine absorbs water then changes the waste into the stool. Peristalsis moves stool in the rectum.
* Lower end of large intestine stores stools unless it is pushed out during the bowel movement out of the anus.

**Session 3**

***Muscular contraction***

* Muscle contraction could be divided into four parts to understand the process muscle contradiction mechanism from the brain to the muscle cell.
* The motor nerve gets a signal from the brain for action potential for passing down a neuron to a junction called neuromuscular junction and it is the part where stimulates the release of calcium into the muscle cell.
* This calcium goes into muscle cells and binds troponin with actin and myosin and contraction uses ATP as an energy source.
* It is the stage where the brain releases hormones and ATP is re-manufactures so that myosin and actin could maintain strong binding.
* When stimulation of nerve stops relaxation occurs and the brain sends a message for releasing hormone. Calcium is a pumped back-breaking link between myosin and actin into the sarcoplasmic reticulum. When ATP would be longer available relaxation would fail.

***Process of synaptic transmission***

* The synaptic transmission consists of different steps
* It is the first step neurotransmitters are synthesized
* In the second step neurotransmitter is the release
* In the third step, the packaging of neurotransmitter takes place
* In the fourth step binding of neurotransmitters take place
* In the fifth step, the chemical signal for stopping is sent.

**Session 4**

***Components of the central and peripheral nervous system***

The nervous system has two main components i.e. the brain and spinal cord. The brain contains about around 86 billion neurons and trillions of support cells known as glia. The spinal cord in a woman is about 43 cm long while it is 45 cm long in men. It is housed by the vertebral column and the backbone, but the spinal cord is shorter than the vertebral column.

The peripheral nervous system is also divided into two major i.e. automatic and somatic nervous systems. The somatic nervous system consists of nerve fibers that send information (sensory) to motor nerves and the central nervous system that points towards skeletal muscle. The autonomic nervous system is further divided into three components that include the sympathetic, parasympathetic and enteric nervous system, which controls internal organs as well as glands. The enteric nervous system consists of nerve fibers that innervate the viscera (gall bladder, pancreas, and gastrointestinal tract, etc.)

***Signal transmission process***

Auditory

Nerves impulses are sent to the brain from the ear through the auditory nerves. Cranial nerves are one of the several sensory nerves which connect nerve impulses to the upper "temporal lobe of the cerebral cortex.

Visual

An optic nerve is a group of nerves that connects and transmits information related to the vision from the eye to the brain. It is the optic nerve that receives light signals through both amacrine and bipolar cells. The signal sent to the brain by the eye interprets the signal into a visual image.

*Olfactory*

In the epithelium, sensory neurons detect odor molecules that are dissolved in mucus and send information about the odor to brain cells and this process is known as sensory transduction.

**Session 5**

***Reproduction***

The ovary cycle refers to the series of changes at the time of the maturation of follicles. In this cycle when the ovum is shed and corpus luteum is developed and the follicular phase shows the development of follicles in response to the release of follicle stimulation hormone (FSH) but if implantation takes place then corpus luteum is maintained.

* Follicle stimulation hormone (FSH) helps in regulation, growth, development, reproductive processes and pubertal maturation of body.
* Luteinizing Hormone (LH) plays an important role in controlling the function of gonads (ovaries in females and testes in males).
* Estrogen plays a role in the development of secondary sexual characteristics in females (breasts, regulations of the menstrual cycle and endometrium). It also helps in the maturation of sperms in males and maintains production of a healthy libido.
* Progesterone helps in the thickening of the lining of uterus each month and helps in nourishing the egg (fertilized)

***Renal system***

In glomerular filtration, both blood and urine are filtered by nephron. In this process, hydrostatic pressure in the glomerulus forces filtrates out of capillaries and into the slits in the nephron. Nephron works in the two-step process for filtering the blood and tubule returns required substances to blood and removes wastes.

Reference

Shortt, A., Lynch, M., Harte, P., Ruttledge, L., & Dennis, P. (2019). *U.S. Patent Application No. 16/301,140*.