**Mid-Term Assignment**

**Course Title: Human Physiology II**

**Rad 2nd semester section A**

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**Marks: 30**

**Note:**

* **Attempt all questions, all questions carry equal marks.**
* **Answer Briefly and to the point, avoid un-necessary details**

**Q1:** (A) A post stroke patient come to clinic, during examination you found that patient is unable to speak nor understand, what you are talking (Global Aphasia), in such case which lobes of brain could be involved?

Answer : we have found a patient who is unable to speak or understand during the examination of post stroke condition. We see both frontal and temporal lobes are effected.

°GLOBAL APHASIA : global Aphasia can occur when there is damage in left hemisphere of brain. If damage encompasses both Werincke's and Broca's areas on the left hemisphere, global Aphasia can occur. In this case, all aspects of speech and language are affected. Patients can say a few words at most and understand only a few words and phrases. They usually cannot carry out commands or name objects. The lobes located in the front and side of your brain, the frontal lobe and temporal lobes are primarily involved in speech formation and understanding.

Explain that lobes and write down its function.

LOBES: Frontal and temporal lobes

FRONTAL LOBE: it is the largest of four major lobes of the brain in mammals. Each of the paired lobes of the brain lying immediately behind the forehead.

FUNCTIONS: frontal lobe are involved ;

In motor problems solving, memory, language, judgment, impulse control, social and sexual behavior.

TEMPORAL LOBE: each of the paired of the brain lying beneath the temples including areas concerned with the understanding of speech.

FUNCTIONS:temporal lobe is involved in primary auditory perception, such as hearing and hold primary auditory cortex. The primary auditory cortex receive sensory information from the ears and secondary areas process information into meaningful units such as speed and words.

(B) A post stroke patient come to clinic, during examination you found that patient have difficulty in walking including problem with balance and also have tremor. Which part of brain could be involved in this patient? Explain that part and write down its function.

ANSWER : a post stroke patient come to clinic, he has difficulty in walk and balance. Which is controlling by a brain part cerebellum.

CEREBELLUM :the cerebellum is located behind the top part of the brain stem and is made of two hemisphere.

FUNCTIONS OF CEREBELLUM :

°Maintenance of posture and balance : the cerebellum is important for making postural adjustments in order to maintain balance. Through its input from vestibular receptors and propioceptors, it modulates commands to motor neurons to compensate for shift in body position or changes in load upon muscles, patients with cerebellar damage suffer from balance disorders, and they often develop stereotyped postural strategies to compensate for this problem.

°Coordination of voluntary muscles : most movements are composed of a number of different muscle groups acting together in a temporally coordinated fashion. One major function of the cerebellum is to coordinate the timing and force of these different muscle groups to produce fluid limb or body movements.

°Motor learning : The cerebellum is important for motor learning. The cerebellum plays important role in adapting and fine-tuning motor programs to make accurate movements through a trial-and-error process. (e.g learning to hit a baseball)

°Anatomy : the cerebellum consists of two hemispheres which are connected by the vermis, a narrow mid line area. Like other structures in the central nervous system, the cerebellum consists of Grey metter and white matter.

°Anatomical lobes: there are three anatomical lobes that can be distinguished in the cerebellum ;the anterior lobe, posterior lobe and flocculonodular lobe. These lobes are divided by two fissures \_ the primary fissures and posterolateral fissure.

°Zones : there are three cerebellar zones. In the midline of the cerebellum is the vermis. Either side of the vermis is the intermediate zone. Lateral to intermediate zone are the lateral hemisphere. There is no difference in gross structure between the lateral hemispheres and intermediate zones.

°Cognitive functions : Although the cerebellum is most understood in terms of its contributions to motor control, it is also involved in certain cognitive functions such as language. Thus, like the basal ganglia, the cerebellum is historically considered as part of the motor system, but it functions extend beyond motor control in ways that are not yet well understood.

**Q 2:** (A) During assessment of post stroke patient, you found that patient have sensory loss over skin of forehead, eye lids and nose as well as teeth of upper jaw, moreover also have motor loss in mylohyoid muscle and in anterior belly of digastric. Which cranial nerve involve in this patient?

Write down function and its different component.

ANSWER : The cranial nerve which is involved in that patient who have sensory lossover skin of forehead, eye, lids and nose as well as teeth of upper jaw is the trigeminal nerve.

COMPONENTS AND FUNCTIONS OF TRIGEMINAL NERVE :

The trigeminal nerve consists of three components or branches ;

1. Opthalmic nerve

2. Maxillary nerve

3. Mandibullar nerve

1. OPTHALMIC NERVE :

Opthalmic nerve supply are sensory, which are from the forehead, eyelids, comea, cilliarly body Iris and to the lacrimal gland and conjunctiva.

2. MAXILLARY NERVE:

Maxillary nerve control sensory supply of the Maxillary bones, the cheaks, upper lip, upper gum and alveolar process etc.

3. MANDIBULLAR NERVE :

Mandibullar nerve consist of both motor and sensory supply.

SENSORY SUPPLY: is to lower lip, chin, lower gum and lower alveolar process etc.

MOTOR SUPPLY : is to the mylohyoid and anterior belly of diagastric muscle.

(B) Post stroke patient come to clinic, during assessment you found that patient have lost general and taste sensation in posterior 1/3 of tongue. Which cranial nerve involve?

Write down its function and components.

ANSWER : the general and test sensation of posterior 1\3 control by glossopharyngeal nerve.

The ninth cranial nerve (CN IX), is a mixed nerve that carries efferent sensory and efferent motor information is known as Glossopharyngeal nerve.

The Glossopharyngeal nerve carries sensory, effort motor and parasympathetic fibers.

It is noted as both sensory and motor, the sensory division of glossopharyngeal nerve is originates from cranial neural crest, while the motor is derived from the basal flate of the ombryonic medulla oblongata.

FUNCTIONS AND COMPONENTS:

Its branches consists of tympatic, tonsillar, atilopharyengeal, carotid dinus nerve, branches of the tongue, lingual branches and a communicating branch to cranial nerve X( vagus nerve).

FUNCTION :

There are a number of functions of glossopharyngeal nerve :

It receives general somatic sensory fibers from the tonsils, the pharynx, the middle ear and posterior 1/3 of the tongue.

It receives special visceral sensory fibers (taste) from the posterior 1/2 of the tongue.

It supplies parasympathetic fibers from the carotid gland via the oitic ganglion.

It contribute to the pharyngeal plexus.

**Q3:** (A) What is accommodation in eye and explain its relation with lens of eye?

Answer : ACCOMMODATION :

The ability of eye to change its focus from distant to near object and from near to distant object.

It is the process of adjecent of focal length.

FAR POINT : the maximum distance from the eye for which a clear image of an object can be seen.

TO THE NEAR POINT : the minimum distance for a clear image. Accommodation usually acts like a reflex including as a part of the accommodation- vergence reflex..

RELATION WITH LENS OF EYE :

The process of accommodation is achieved by the lens changing to the shape..

Accommodation is the adjustment of optics of the eye to keep an object in focus in the retina as its distance from the eye caries.

LENS : this is the transparent structure in the eye, it is biconvex in shape, it is bordered interiorly by a ring it forms with the posterior side of the iris. The lens is held by the suspensory ligaments and has a diameter of 10mm and a height of 4mm in an adult.

PUPIL: the pupil is located in the middle of the eyes, it is black in color and constricts to prevent light rays that have diverged from touching the retina and causing blurred vision.

Light enters the human eye via pupil. When light intensity is more, iris compress to reduce the size of pupil and protect it from overexposure of light.

(B) How stimulus of light goes through eye ball and reach up to Brain? Explain in detail

ANSWER : the path of light through the eye begins with the objects viewed and how they produce reflect or alter light in various ways. When your eyes receive light, it begins a second journey through the eyes optical parts that adjust and focus light to the nerves and carries image to our brain. Standing outdoors

EXAMPLE : a night seen may be lit by street lights, light from passing cars and the moon. Light allows u to see the sources themselves and the items they illuminate

ENTERNING THE CORNEA: the first thing light encounters when it enters the eye is the cornea . A protective clear covering over the pupil and iris. The cornea bends the light and begins to form an image.

PUPIL : the Gatekeeper

Light passes from the cornea to the pupil, the dark circle in the center of the iris.,which is the colored portion of the eye. The pupil regulates the amount of light that will enter the inner eye based on environmental conditions.

THROUGH THE LENS : from the pupil light rays travel to the lens of the eye.the lens is clear flexible structures that focus an upside down image onto the retina.

RECEPTION AT THE RETINA : the lens focuses light and images on the retina., a layer of light sensitive cells at the back of the eye. It is made up of two kinds of photo receptors cells: cones and rods. The cones transmit colors and sharp images. The concentration of cones is low on the sides of the retina and increase as the cones approach the center of the retina, or the mecula. The rods are more sensitive to light and are more numerous than the cones.

OPTIC NERVE AND BRAIN:

Once the retina senses the image, it sends impulses to the optic nerve at the back of the eye. The optic nerve then transmit them to the special areas in the brain. Which automatically flips upside down image so that it becomes upright again. Diseases or injury can damage optic nerve, resulting in varying degrees of blindness.