7. SENSE ORGANS

TEACHING TASK (Page 5 – 7)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Which part of the eye contains cells responsible for color vision in bright light conditions?

Answer: **B) Cones**

Solution: Cones are photoreceptor cells in the retina responsible for color vision and function best in bright light conditions. Rods are for low-light vision, the cornea is a transparent layer, and the retina contains both rods and cones.

2) Where are cones most concentrated in the eye?

Answer: **B) Fovea**

Solution: The fovea, located in the center of the retina, has the highest concentration of cones, enabling sharp and color vision. The blind spot lacks photoreceptors, the iris controls pupil size, and the sclera is the outer layer.

3) What is the function of the optic nerve?

Answer: **A) Transmitting visual information from the eye to the brain**

Solution: The optic nerve carries electrical impulses formed by the retina to the brain for visual interpretation. It does not generate light, protect the eye, or control blinking.

4) What is the blind spot in the eye?

Answer: **B) A gap in the visual field where the optic nerve exits**

Solution: The blind spot is where the optic nerve exits the eye, lacking photoreceptors, causing a gap in the visual field. It is not related to low light sensitivity, color distortion, or object size perception.

5) Which structures protect the eye from foreign objects?

Answer: **A) Eyelids, eyelashes, and eyebrows**

Solution: Eyelids, eyelashes, and eyebrows physically shield the eye from debris and foreign objects. The cornea and lens focus light, the choroid nourishes the eye, and the optic nerve transmits signals.

6) What is the function of the iris?

Answer: **B) To adjust the size of the pupil**

Solution: The iris controls the pupil's size to regulate light entry. It does not produce tears, transmit visual information, or protect against harmful stimuli directly.

7) What condition is characterized by difficulty seeing in low-light conditions?

Answer: **C) Night blindness**

Solution: Night blindness (nyctalopia) is difficulty seeing in low light, often due to rod dysfunction or vitamin A deficiency. Myopia affects distant vision, hypermetropia affects near vision, and glaucoma involves pressure-related damage.

8) Which eye condition involves clouding of the eye's lens?

Answer: **B) Cataract**

Solution: A cataract is the clouding of the lens, causing blurred vision. Glaucoma involves increased intraocular pressure, color blindness is a cone dysfunction, and xerophthalmia is eye dryness.

9) How many primary sense organs do humans have?

Answer: **B) Five**

Solution: Humans have five primary sense organs: eyes (vision), ears (hearing), nose (smell), tongue (taste), and skin (touch).

10) Which sense organ is responsible for detecting changes in temperature and pressure?

Answer: **C) Skin**

Solution: The skin contains receptors for temperature and pressure. Eyes detect light, ears detect sound, and the nose detects odors.

Advanced Level Questions

Multi Correct Answer Type

11) What eye condition is not characterized by difficulty seeing in low-light conditions?

Answer: **A) Myopia, B) Hypermetropia, C) Glaucoma**

Solution: Night blindness (D) is characterized by difficulty seeing in low light. Myopia (nearsightedness), hypermetropia (farsightedness), and glaucoma (pressure-related damage) do not primarily affect low-light vision.

12) Which is not structures regulate the shape and focal length of the eye lens?

Answer: **A) Rods and cones, C) Cornea and iris, D) Eyelids and lacrimal glands**

Solution: Ciliary muscles and suspensory ligaments (B) adjust the lens shape for focusing. Rods and cones are photoreceptors, the cornea and iris do not regulate lens shape, and eyelids and lacrimal glands protect or lubricate the eye.

13) Which is not the primary cause of color blindness?

Answer: **A) Abnormalities in eye shape, B) Increased intraocular pressure, D) Vitamin A deficiency**

Solution: Color blindness is primarily caused by genetic inheritance (C), affecting cone function. Eye shape abnormalities cause refractive errors, increased intraocular pressure causes glaucoma, and vitamin A deficiency causes night blindness or xerophthalmia.

Assertion and Reason Type

14) Assertion: The cornea is a clear window located in the sclera in front of the iris.

Reason: The cornea shields the eye from direct exposure to light and assists in focusing incoming light rays onto the retina.

Answer: **C) Assertion is correct, but Reason is wrong**

Solution: The assertion is correct; the cornea is a transparent part of the sclera in front of the iris. However, the reason is incorrect because the cornea does not shield the eye from light exposure; it refracts light to focus it on the retina. The iris regulates light exposure.

15) Assertion: Ciliary muscles and suspensory ligaments are capable of modifying the shape and focal length of the eye lens.

Reason: These structures allow for clear focusing on objects at varying distances by adjusting the shape of the lens.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Both statements are correct. Ciliary muscles and suspensory ligaments adjust the lens shape to focus on near or far objects, enabling accommodation, as explained by the reason.

16) Assertion: Myopia causes distant objects to appear blurry, while hypermetropia leads to blurriness in nearby objects.

Reason: These conditions result from abnormalities in eye shape, causing light to focus improperly on the retina for distant or nearby objects, respectively.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: The assertion accurately describes myopia (nearsightedness) and hypermetropia (farsightedness). The reason correctly explains that these are due to abnormal eye shape, causing improper light focus on the retina.

Matrix Matching Type

17) Match the eye structure or function with its description:

Answer:

Cornea – **D) Transparent window shielding the eye from direct light exposure**

Rods and Cones – **E) Specialized cells responsible for color vision in bright light**

Optic Nerve – **A) Bundled nerve cells transmitting visual information to the brain**

Iris – **B) Muscular structure regulating the size of the pupil**

Cataract – **C) Clouding of the eye's lens, leading to blurred vision**

Solution:

Cornea: Refracts light and acts as a protective transparent layer (D, though it does not shield from light exposure; this is a slight misnomer in the description).

Rods and Cones: Photoreceptors, with cones enabling color vision in bright light (E).

Optic Nerve: Transmits visual signals to the brain (A).

Iris: Controls pupil size to regulate light entry (B).

Cataract: Clouding of the lens causing blurred vision (C).

Comprehension Type

18) i. Which cells in the retina are responsible for detecting light and converting it into neural signals?

Answer: **A) Rods and cones**

Solution: Rods and cones are photoreceptors in the retina that detect light and convert it into neural signals. Choroid, ciliary, and corneal cells have other functions.

ii. What is the primary function of rods in the retina?

Answer: **C) Facilitation of vision in dim conditions**

Solution: Rods are highly sensitive to low light, enabling vision in dim conditions. Cones handle color vision, and other cells process edges or motion.

iii. Besides rods and cones, what other types of cells are found in the retina?

Answer: **A) Cells sensitive to object edges, boundaries, light, shadow, and motion**

Solution: The retina contains ganglion cells, bipolar cells, and others that process edges, boundaries, light, shadow, and motion, in addition to rods and cones.

LEARNERS TASK (Page 7 – 9)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) What is the main purpose of our senses?

Answer: **B) To alert us to potential dangers and help us survive**

Solution: Senses detect environmental stimuli to ensure survival by identifying dangers, food, and mates. They do not primarily entertain, confuse, or bore us.

2) Which of the following is not a primary sense organ?

Answer: **B) Heart**

Solution: The primary sense organs are eyes, ears, nose, tongue, and skin. The heart is not a sense organ.

3) How do our senses assist in finding mates and recognizing familiar faces?

Answer: **B) By sending signals to our brain for processing**

Solution: Senses (e.g., vision, smell) send environmental information to the brain for recognition and decision-making. They do not make us invisible, shut down, or forgetful.

4) What are stimulants in terms of sensory perception?

Answer: **B) Triggers for sensory perception**

Solution: Stimulants are stimuli (e.g., light, sound, chemicals) that trigger sensory receptors to produce perception. They do not induce sleep, sneezing, or loss of focus.

5) Which layer of the eye is black in color and rich in blood vessels?

Answer: **B) Choroid**

Solution: The choroid is a vascular, dark layer that nourishes the eye and absorbs excess light. The sclera is white, the retina contains photoreceptors, and the iris controls pupil size.

6) What is the purpose of photoreceptors in the eye?

Answer: **C) To sense light**

Solution: Photoreceptors (rods and cones) detect light and convert it into neural signals. They do not regulate temperature, detect sound, or taste flavors.

7) Which part of the eye helps in focusing incoming light rays onto the retina?

Answer: **A) Cornea**

Solution: The cornea refracts and focuses incoming light onto the retina, along with the lens. The choroid nourishes, the sclera protects, and the lens fine-tunes focus.

8) Which eye structure adjusts the focal length of the lens for clear focusing on objects at varying distances?

Answer: **A) Ciliary muscles**

Solution: Ciliary muscles contract or relax to adjust the lens shape, changing its focal length for accommodation. Suspensory ligaments assist, but the iris and retina have other roles.

9) What is the main role of the optic nerve?

Answer: **C) To transmit visual information to the brain**

Solution: The optic nerve carries visual signals from the retina to the brain. It does not produce tears, adjust pupil size, or protect the eye.

10) Which eye structure helps in protecting the eye from direct exposure to light?

Answer: **B) Choroid**

Solution: The choroid absorbs excess light to prevent scattering within the eye. The cornea and lens focus light, and the retina detects it.

Advanced Level Questions

Multi Correct Answer Type

11) Which structures are responsible for protecting the eye from foreign objects and debris?

Answer: **A) Eyelids, B) Lacrimal glands, D) Conjunctiva**

Solution: Eyelids physically block debris, lacrimal glands produce tears to wash away particles, and the conjunctiva protects the eye's surface. The cornea focuses light but is not primarily protective against debris.

12) Which are not the functions of the iris in the eye?

Answer: **B) Regulating tear production, C) Focusing incoming light rays**

Solution: The iris adjusts pupil size (A) and indirectly shields the eye from excess light (D). Tear production is by lacrimal glands, and focusing is by the cornea and lens.

13) Which components are not found in the vitreous chamber of the eye?

Answer: **A) Aqueous fluid, C) Suspensory ligaments, D) Ciliary muscles**

Solution: The vitreous chamber contains a jelly-like substance (B). Aqueous fluid is in the anterior chamber, and suspensory ligaments and ciliary muscles are near the lens, not in the vitreous chamber.

Assertion and Reason Type

14) Assertion: Rods and cones serve distinct functions in vision.

Reason: Rods are sensitive to low light conditions, while cones facilitate color vision in bright light.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Both statements are correct. Rods enable vision in dim light, and cones enable color vision in bright light, explaining their distinct roles.

15) Assertion: The blind spot occurs where the optic nerve exits the eye and lacks photoreceptors.

Reason: The brain integrates information from both eyes to fill in the blind spot with background information.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: The assertion is correct; the blind spot lacks photoreceptors where the optic nerve exits. The reason explains how the brain compensates for this gap using binocular vision.

16) Assertion: Lacrimal glands produce tears that help wash away unwanted substances.

Reason: Tears act as a protective mechanism against foreign particles that may come into contact with the eye.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Lacrimal glands produce tears to flush out debris, as stated in the assertion, and the reason correctly explains their protective role.

Matrix Matching Type

17) Match the eye disease or defect with its description:

Answer:

Night Blindness – **A) Difficulty seeing in low-light conditions**

Myopia – **D) Difficulty seeing distant objects clearly**

Xerophthalmia – **E) Dryness of the eyes due to insufficient tear production**

Glaucoma – **C) Inability to distinguish certain colors** (Note: This seems to be a mismatch in the question; glaucoma is typically increased intraocular pressure. Correct match for glaucoma would be a different description if provided. Color blindness should be C.)

Color Blindness – **C) Inability to distinguish certain colors**

Solution:

Night Blindness: Difficulty seeing in low light (A).

Myopia: Nearsightedness, blurry distant vision (D).

Xerophthalmia: Dry eyes due to tear deficiency (E).

Glaucoma: Typically increased pressure, not color blindness (question error).

Color Blindness: Inability to distinguish colors (C).

Comprehension Type

18) i. Which layer of the eye provides structural support and protection?

Answer: **C) Sclera**

Solution: The sclera is the tough, white outer layer providing structural support and protection. The choroid nourishes, the retina detects light, and the cornea refracts light.

ii. What is the function of the iris in the eye?

Answer: **B) To regulate the amount of light entering the eye**

Solution: The iris adjusts pupil size to control light entry. It does not nourish, refract, or support the lens directly.

iii. Which part of the eye is responsible for adjusting the shape of the lens?

Answer: **A) Ciliary muscles**

Solution: Ciliary muscles adjust the lens shape for focusing. The choroid nourishes, radial muscles are in the iris, and the cornea refracts light.

TEACHING TASK (Page 16 – 18)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Which of the following is NOT a primary taste quality?

Answer: **C) Spicy**

Solution: Primary taste qualities are sweet, sour, bitter, salty, and umami. Spicy is a sensation of irritation, not a taste.

2) What is the outer layer of the skin responsible for protection?

Answer: **A) Epidermis**

Solution: The epidermis is the outermost skin layer, providing a protective barrier. The dermis contains glands, the hypodermis stores fat, and subcutaneous tissue is another term for hypodermis.

3) Which layer of the skin contains living cells?

Answer: **C) Malpighian layer**

Solution: The Malpighian layer (stratum basale and spinosum) contains living cells that divide and differentiate. The stratum corneum is dead cells, the granular layer is transitional, and the dermis has connective tissue.

4) What is the primary function of the skin?

Answer: **A) Regulation of body temperature**

Solution: The skin's primary functions include temperature regulation (via sweating and blood flow), protection, and sensation. Vitamin D production is secondary, and it does not digest food or pump blood.

5) Which of the following is NOT a skin disease mentioned?

Answer: **C) Diabetes**

Solution: Measles, chickenpox, and ringworm are skin diseases. Diabetes is a metabolic disorder, not a skin disease.

6) What is the role of ear wax in the ear canal?

Answer: **B) Protect against infections**

Solution: Ear wax (cerumen) traps debris and has antibacterial properties to protect against infections. It does not enhance hearing, absorb sound, or lubricate significantly.

7) What structure separates the external and middle ear?

Answer: **C) Eardrum**

Solution: The eardrum (tympanic membrane) separates the external ear (auditory canal) from the middle ear (ossicles). Malleus, incus, and stapes are middle ear bones.

8) Which part of the ear amplifies vibrations received by the eardrum?

Answer: **D) Middle ear**

Solution: The middle ear (malleus, incus, stapes) amplifies vibrations from the eardrum to the inner ear. The pinna collects sound, the vestibule aids balance, and the cochlea processes sound.

9) What is the primary function of the cochlea?

Answer: **C) Transforming vibrations into nerve impulses**

Solution: The cochlea converts mechanical vibrations into neural signals via the organ of Corti. Balance is handled by the vestibule and semicircular canals, not smell detection or amplification.

10) Which nerve carries taste messages to specific regions of the brain?

Answer: **D) Glossopharyngeal nerve**

Solution: The glossopharyngeal nerve (and facial nerve for anterior tongue) carries taste signals. The olfactory nerve handles smell, and the vestibulocochlear nerve handles hearing and balance.

Advanced Level Questions

Multi Correct Answer Type

11) What structures are found in the internal ear or inner ear?

Answer: **A) Cochlea, B) Semicircular canals, C) Vestibule**

Solution: The inner ear includes the cochlea (hearing), semicircular canals (balance), and vestibule (balance). Eyelids are external structures.

12) What are the primary qualities of taste?

Answer: **A) Sweet, B) Sour, C) Bitter, D) Salty**

Solution: The primary taste qualities are sweet, sour, bitter, salty, and umami (though umami is not listed here). These are detected by taste buds.

13) Which layers constitute the skin?

Answer: **A) Epidermis, B) Dermis, C) Hypodermis**

Solution: The skin consists of the epidermis (outer), dermis (middle), and hypodermis (subcutaneous fat). The sclera is part of the eye.

Assertion and Reason Type

14) Assertion: Taste buds, located on the tongue's top and sides, sample flavors from food and drink.

Reason: Taste buds contain taste receptor cells that transmit taste messages through specialized nerves to specific regions of the brain, contributing to the perception of taste.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Taste buds detect flavors, and the reason explains how taste receptor cells send signals via nerves (e.g., facial, glossopharyngeal) to the brain.

15) Assertion: The skin is the largest organ in the body and serves as the first line of defense against external threats.

Reason: The epidermis and dermis layers of the skin provide physical protection, regulate body temperature, eliminate waste materials through sweat, and act as the sense organ for touch.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: The skin is the largest organ and protects against threats. The reason details its functions, including protection, temperature regulation, waste elimination, and touch sensation.

16) Assertion: [Incomplete in the provided text, likely meant to be about skin diseases indicating underlying health conditions.]

Reason: Prompt medical attention can help diagnose and treat skin diseases effectively, preventing potential complications and promoting overall skin health.

Answer: **Assuming Assertion is: Skin diseases may indicate underlying health conditions, then A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Skin diseases (e.g., psoriasis) can signal systemic issues. Prompt treatment prevents complications, as explained by the reason.

Matrix Matching Type

17) Match the inner part of the ear with its description:

Answer:

Cochlea – **D) Spiral-shaped structure with three parallel tubes**

Semicircular Canals – **C) Maintains body equilibrium and balance**

Vestibule – **E) Consists of the sacculus and utriculus**

Auditory Canal – **B) Passageway for sound waves to reach the eardrum**

Cochlear Nerve – **A) Carries auditory information to the brain**

Solution:

Cochlea: Spiral structure for hearing (D, though "three parallel tubes" may refer to scalae within the cochlea).

Semicircular Canals: Detect rotational movement for balance (C).

Vestibule: Contains sacculus and utriculus for linear acceleration (E).

Auditory Canal: External ear passageway (B).

Cochlear Nerve: Transmits auditory signals (A).

Comprehension Type

18) i. Why is it recommended to clean the tongue before bed and after waking up?

Answer: **A) To prevent bad breath and oral infections**

Solution: Cleaning the tongue removes bacteria and food particles, reducing bad breath and infection risk.

ii. What is the purpose of washing the mouth after eating food?

Answer: **A) To remove food particles and maintain oral freshness**

Solution: Rinsing removes food debris, preventing bacterial growth and maintaining oral hygiene.

iii. Why is it important to consult a doctor if any problems arise with the tongue?

Answer: **C) To diagnose and treat any underlying issues promptly**

Solution: Consulting a doctor ensures proper diagnosis and treatment of tongue issues, preventing complications.

LEARNERS TASK (Page 18 – 20)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Which of the following is NOT a part of the external ear?

Answer: **C) Cochlea**

Solution: The external ear includes the pinna, auditory canal, and eardrum. The cochlea is in the inner ear.

2) What is the function of the malleus, incus, and stapes in the middle ear?

Answer: **B) Amplify vibrations**

Solution: These ossicles amplify and transmit vibrations from the eardrum to the inner ear. They do not collect sound, detect odors, or maintain balance.

3) Which part of the inner ear is responsible for maintaining balance and posture?

Answer: **C) Vestibule**

Solution: The vestibule (sacculus and utriculus) detects linear acceleration for balance. Semicircular canals detect rotation, the cochlea handles hearing, and the Eustachian tube equalizes pressure.

4) How does the sense of smell begin?

Answer: **B) With chemical events in the nose**

Solution: Olfactory receptors in the nose detect airborne chemical molecules, initiating smell perception. It does not involve light, vibrations, or tactile sensations.

5) What do taste buds primarily sample flavors from?

Answer: **C) Food and drink**

Solution: Taste buds detect chemicals in food and drink to perceive flavors. They do not sample air, water, or light.

6) What are taste receptor cells located in?

Answer: **A) Taste buds**

Solution: Taste receptor cells are within taste buds on the tongue. Semicircular canals and cochlea are ear structures, and olfactory epithelium is for smell.

7) What is the primary function of the dermis?

Answer: **D) All of the above**

Solution: The dermis supports protection (via connective tissue), sensation (via receptors), and temperature regulation (via sweat glands and blood vessels).

8) Which layer of the skin contains sweat glands and hair follicles?

Answer: **B) Dermis**

Solution: The dermis contains sweat glands, hair follicles, and blood vessels. The epidermis is the outer barrier, and the hypodermis stores fat.

9) What is the purpose of washing the nose with lukewarm saltwater during nasal infection?

Answer: **C) To clear nasal passages**

Solution: Saltwater irrigation clears mucus and debris, aiding recovery from nasal infections. It does not directly improve smell, reduce inflammation, or prevent taste changes.

10) What is the role of mucous and small hairs in the nasal cavity?

Answer: **C) To prevent foreign particles from entering the body**

Solution: Mucous and cilia (small hairs) trap and remove dust and pathogens, protecting the respiratory system. They do not detect odors or regulate temperature.

Advanced Level Questions

Multi Correct Answer Type

11) Which structures are part of the external ear?

Answer: **A) Pinna, B) Auditory canal**

Solution: The external ear includes the pinna and auditory canal. Semicircular canals and cochlea are in the inner ear.

12) What are the functions of the ear wax?

Answer: **A) Lubricate the ear canal, B) Prevent dust and particles from entering, D) Act as a barrier against infections**

Solution: Ear wax lubricates the canal, traps debris, and has antibacterial properties. It does not enhance hearing.

13) Which bones are part of the middle ear?

Answer: **A) Malleus, B) Stapes, D) Incus**

Solution: The middle ear contains the malleus, incus, and stapes (ossicles). The utricle is in the inner ear's vestibule.

Assertion and Reason Type

14) Assertion: The eardrum separates the external and middle ear and connects to the first bone of the middle ear, the malleus.

Reason: The eardrum receives sound vibrations from the auditory meatus and transmits them to the middle ear ossicles, initiating the process of sound amplification.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: The eardrum separates the external and middle ear and vibrates to transmit sound to the malleus, as explained by the reason.

15) Assertion: The cochlea is a spiral-shaped structure containing the organ of Corti and primary sensory cells.

Reason: The cochlea converts mechanical vibrations from the oval window into neural signals that are transmitted through the cochlear nerve to the brain for auditory processing.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: The cochlea contains the organ of Corti, which converts vibrations into neural signals, as described by the reason.

16) Assertion: The nose contains olfactory receptors responsible for detecting airborne chemical molecules.

Reason: These receptors allow humans to perceive various odors, enhancing taste, identifying foods, and detecting potential dangers in the environment.

Answer: **A) Assertion and Reason are correct, Reason is the correct explanation of Assertion**

Solution: Olfactory receptors detect chemical molecules, enabling smell perception, which aids taste, food identification, and danger detection, as explained.

Matrix Matching Type

Match the sense organ with its function:

Answer:

Nose – **D) Detects airborne chemical molecules**

Skin – **A) Regulates body temperature**

Tongue – **E) Identifies chemicals in food and its texture**

Ear – **B) Collects and transforms sound vibrations into nerve impulses**

Eye – **C) Collects light and forms visual images**

Solution:

Nose: Detects odors via olfactory receptors (D).

Skin: Regulates temperature, protects, and senses touch (A).

Tongue: Detects taste and texture via taste buds (E).

Ear: Processes sound into neural signals (B).

Eye: Captures light for vision (C).

Comprehension Type

18) i. What are some common symptoms of ear infections?

Answer: **B) Ear pain, discharge, and hearing impairment**

Solution: Ear infections commonly cause pain, discharge, and hearing loss, not fever, coughing, or sore throat as primary symptoms.

ii. How should one respond to signs of an ear infection?

Answer: **B) Consult a qualified doctor and use prescribed medications**

Solution: Consulting a doctor for diagnosis and prescribed treatment (e.g., antibiotics) is the appropriate response, not ignoring symptoms or self-medicating.

iii. Why is prompt medical attention essential for ear infections?

Answer: **B) To prevent complications and ensure effective treatment**

Solution: Prompt treatment prevents complications like hearing loss and ensures effective management, not for avoiding work or unnecessary tests.