

Name lab time date



NAME LAB TIME/DATE _ Special Senses: Vision Anatomy of the Eye

1. Name five accessory eye structures that contribute to the formation of tears and/or aid in lubrication of the eyeball, and then name the major secretory product of each. Indicate which has antibacterial properties by circling the correct secretory product. Accessory structures lacrimal glands conjunctiva tarsal or meibomian glands caruncle ciliary glands Product saline solution; Clysozym0 mucus oily secretion whitish, oily secretion sweat

2. The eyeball is wrapped in adipose tissue within the orbit. What is the function of the adipose tissue? To package, protect, and cushion the eyeball in the bony orbit.

3. Why does one often have to blow one's nose after crying? Because tears drain into the nasal cavities via the nasolacrimal ducts.

4. Identify the extrinsic eye muscle predominantly responsible for each action described below.

lateral rectus medial rectus inferior oblique inferior rectus superior rectus superior oblique

l. 2. 3. turns the eye laterally turns the eye medially turns the eye up and laterally turns the eye inferiorly and medially turns the eye superiorly and medially turns the eye down and laterally

4. 5. 6. S. What is a sty? Inflammation of a small oil or sweat gland associated with the eye exterior.

Conjunctivitis? Inflammation of the conjunctiva. 161

6. Correctly identify each lettered structure in the diagram by writing the letter next to its name in the numbered list.

a b c 1. anterior chamber 2. anterior segment 3. bipolar neurons f p 4. choroid 5. ciliary body and processes 6. ciliary muscle 7. cornea 8. dura mater 9. fovea centralis 10. ganglion cells 11. iris 12. lens 13. optic disc 14. optic nerve 15. photoreceptors 16. posterior chamber 17. retina e e a j ---~¥.:::++-g h q u o b r k s n h d m 18. sclera 19. scleral venous sinus 20. suspensory ligaments (ciliary zonule) 21. posterior segment

g Notice the arrows drawn close to the left side of the iris in the diagram

above. What do they indicate? The flow of aqueous humor from the ciliary processes of the ciliary body to the scleral venous sinus (canal of Schlemm).

7. The iris is composed primarily of two smooth muscle layers, one arranged radially and the other circularly. Which of these dilates the pupil?

_____ The radial layer: _____ e_r 8. You would expect the pupil to be dilated in which of the following circumstances? Circle the correct response(s). a. in bright light _____ (b. in dim light) c. focusing for near vision (d. observing distant objects) 9. The intrinsic eye muscles are controlled by (circle the correct response): (autonomic nervous system) somatic nervous system 162 Review Sheet 24 10. Match the key responses with the descriptive statements that follow. Key: a. b. c. d. aqueous humor choroid ciliary body ciliary processes of the ciliary body e. f. g. h. i. cornea fovea centralis iris lens optic disc j. k. l. retina sclera scleral venous sinus m. vitreous humor a; aqueous humor k: sclera i: optic disc c: ciliary body 1. fluid filling the anterior segment of the eye 2. the " white" of the eye 3. part of the retina that lacks photoreceptors 4. modification of the choroid that controls the shape of the crystalline lens and contains the ciliary muscle 5. drains the aqueous humor from the eye 6. layer containing the rods and cones 7. substance occupying the posterior segment of the eyeball 8. forms the bulk of the heavily pigmented vascular layer g; iris 9. smooth muscle structures (2) 10. area of critical focusing and discriminatory vision 11. form (by filtration) the aqueous humor 12. light-bending media of the eye (4) l; scleral venous sinus j; retina m; vitreous humor b; choroid c; ciliary body f; fovea centralis d; ciliary processes of the ciliary body a; aqueous humor m; vitreous humor e; cornea k; sclera e; cornea h; lens 13. anterior continuation of the sclera-your " window on the world" 14. composed of tough, white, opaque, fibrous connective tissue

Microscopic Anatomy of the Retina 11. The two major layers of the retina are the epithelial and neural layers. In the neural layer, the neuron populations are arranged as follows from the pigmented epithelial layer to the vitreous humor. (Circle the proper response.) bipolar cells, ganglion cells, photoreceptors ganglion cells, bipolar cells, photoreceptors 12. The axons of the _____: g_a_n_g_l_i_o_n photoreceptors, ganglion cells, bipolar cells (photoreceptors, bipolar cells, ganglion cells) cells form the optic nerve, which exits from the eyeball. 13. Complete the following statements by writing either rods or cones on each blank. The dim light receptors are the _____s mostly _____s . Only _____s are found in the fovea centralis, whereas _____s are the photoreceptors that operate best are found in the periphery of the retina. _____s in bright light and allow for color vision. Review Sheet 24 163 Dissection of the Cow (Sheep) Eye 14. What modification of the choroid that is not present in humans is found in the cow eye? _____p_e_t_u_m_l_u_c_l_u_d_u_m What is its function? To reflect light that enters the eye, thus increasing light stimulation of the retina under dim light conditions. 15. What does the retina look like? Thin yellowish white membrane. (Often becomes crumpled during dissection of the eye.) _____ At what point is it attached to the posterior aspect of the eyeball? _____ Visual Pathways to the Brain 16. The visual pathway to the occipital lobe of the brain consists most simply of a chain of five cells. Beginning with the photoreceptor cell of the retina, name them and note their location in the pathway. 1. 2. 3. photo receptor bipolar ganglion cell; retina 4. 5. neuron; lateral geniculate nucleus (visual) of the thalamus cortex of the cell; retina cell; retina cortical neuron; occipital cerebral hemisphere(s) 17. Visual field tests are done to reveal destruction along the visual pathway from the retina

to the optic region of the brain. Note where the lesion is likely to be in the following cases. Normal vision in left eye visual field; absence of vision in right eye visual field: R. L. g. h. t. o. p. t. i. c. n. e. r. v. e. Normal vision in both eyes for right half of the visual field; absence of vision in both eyes for left half of the visual field: Right optic tract (or right optic cortex) 18. How is the right optic tract anatomically different from the right optic nerve? The right optic nerve contains fibers from the right eye only. The right optic tract contains fibers from the lateral aspect of the right eye and the medial aspect of the left eye. Visual Tests and Experiments 19. Match the terms in column B with the descriptions in column A. Column A g, 'refraction --"-----": 1. '____. 1 Column B a. b. c. d. e. f. g. accommodation astigmatism convergence emmetropia hyperopia myopia refraction li h t b en di ig mg ability to focus for close (less than 20 feet) vision normal vision inability to focus well on close objects (farsightedness) . nearslyg h te dn ess blurred vision due to unequal curvatures of the lens or cornea medial movement of the eyes during focusing on close objects a; accommodation 2. __ _d; _e_m_m_e_t_r_o-,-p_ia 3. _e.... _h....: y.!.. p_el_o.!.. p_ia 4. l: myopia -'-'-----'---'____ 5. _b....; _a_s_ti.... gm_at_is_m __ 6. _c-,-; _c_0_n_v_e_r.... ge_n_c_e __ 7. 164 Review Sheet 24 '