

Tanta University Faculty of Medicine Ophthalmology Department

Master Anatomy Exam August 2021 Allowed Time: 3 hours

Essay Qs: Please discuss the following: : (5 marks each)

- 1-Discuss the detailed anatomy of the foramina of the orbit
- 2-Discuss the anatomy and embryology of the cornea
- 3-Discuss the anatomy of the nasociliary nerve and its applied anatomy

MCQs: Please choose the single best answer: (15 Marks)

- 1- Which one of the following bones is **NOT** part of the medial orbital wall?
 - A. Maxilla.
 - B. Ethmoid.
 - C. Sphenoid.
 - D. Palatine
- 2- Which orbital wall is the strongest?
 - A. Medial.
 - B. Inferior.
 - C. Lateral.
 - D. Superior.
- 3- The inferior oblique muscle is all, **EXCEPT**:
 - A. Has a 4 mm tendon.
 - B. Inserts near the foveal location.
 - C. Is connected to the ciliary ganglion.
 - D. Is the only muscle with an anterior origin.
- 4- The following structure is **ANTERIOR** to the grey line:
 - A. Meibomian gland orifices
 - B. Tarsal plate
 - C. Glands of Moll
 - D. The white line
- 5- Select the **CORRECT** description of autonomic innervation to the eye.
 - A. The iris sphincter muscle receives sympathetic innervation via the short ciliary nerves; the iris dilator muscle receives parasympathetic innervation via the short ciliary nerves.
 - B. The iris sphincter muscle receives parasympathetic innervation via the short ciliary nerves; the iris dilator muscle receives sympathetic innervation by the short ciliary nerves.
 - C. The iris sphincter muscle receives parasympathetic innervation via the short ciliary nerves; the iris dilator muscle receives sympathetic innervation via the long ciliary nerves.
 - D. The iris sphincter muscle receives parasympathetic innervation via the long ciliary nerves; the iris dilator muscle receives sympathetic innervation via long ciliary nerves.
- 6- The canal of Schlemm:
 - A. Lies posterior to the scleral spur
 - B. On average is 1 mm in long axis
 - C. Drains into the vortex veins
 - D. Is lined by endothelium

- 7- Which muscle inserts the farthest posterior to the limbus
 - A. Medial rectus
 - B. Superior oblique
 - C. Superior rectus
 - D. Inferior rectus
- 8- The conjunctiva:
 - A. Contains two geographical zones: palpebral and bulbar.
 - B. Contains lymphoid tissue.
 - C. Fuses with the optic nerve sheath.
 - D. Is composed of keratinized squamous epithelium.
- 9- Which of the following is **NOT TRUE** about the cornea?
 - A. The tear-corneal epithelium surface forms a positive lens of approximately 40 D
 - B. The central cornea is steeper than the peripheral cornea
 - C. The average central corneal thickness is 500 to 550 μm
 - D. The anterior surface of the cornea is less curved than the posterior surface of the cornea
- 10- The corneal stroma does NOT contain
 - A. type II collagen
 - B. type I collagen
 - C. type V collagen
 - D. type III collagen
- 11- The sclera is **NOT** characterized by that:
 - A. It contains an endothelium lined sinus called Schlemm's canal
 - B. It has 4 middle apertures found 4 mm in front of the equator
 - C. It is 0.3 mm thick just behind the insertion of the recti
 - D. It is 0.6 mm thick at the equator
- 12- The following is *FALSE* about the superior oblique muscle:
 - A. It becomes tendinous before reaching the trochlea
 - B. It is the primary extorter of the globe in the primary position
 - C. It acts as a pure depressor when the globe is adducted 51 degrees
 - D. It passes between the superior rectus and the globe on its way to its insertion
- 13- Choose the **CORRECT** statement:
 - A. The inner plexiform layer is anterior to the inner nuclear layer.
 - B. The external limiting membrane is posterior to the rod/cone segments.
 - C. The ganglion cell layer carries the axons of the ganglion cells.
 - D. The outer plexiform layer contains the nuclei of the photoreceptors.
- 14- Which one of the extraocular muscles is served by a single nucleus that is shared by both oculomotor nerves?
 - A. Superior rectus.
 - B. Medial rectus.
 - C. Inferior oblique.
 - D. Levator palpebrae superioris.
- 15- Which is **TRUE** regarding the visual pathway:
 - A. Over 50% of the visual fibers decussate in the optic chiasm
 - B. Some fibers leave the optic radiation to connect to the pretectal area via the superior colliculus
 - C. Fibers from the contralateral optic nerve synapse in layers 1,3, and 6 in the lateral geniculate
 - D. Meyer's loop is formed by the inferior fibers of the optic radiation passing though the parietal lobe

***** Best of wishes *****

Tanta University

Master of Science in Anatomy& Embryology

Faculty of Medicine

Embryology Examination

Human Anatomy & Embryology Dep.

Date: 17/8 /2021

Time Allowed: 3 Hours

Total: 90 Marks

Number of Questions:8 Short essay+ 25 MCQ (6 pages)



EMBRYOLOGY (1st SEMESTER MASTER)

All questions to be answered

Short Essay Questions (65 marks)

- 1. Describe the process of neurulation including definitions for the terms, neural folds, neural tube, and neural tube closure. Where is neural tube closure initiated and how does it proceed? At which week in gestation is the process completed? What happens if neural tube closure fails cranially and caudally? What are Neural tube defects(NTD) and how can most be prevented? (6 marks)
- 2. Outline cell migration during the 3rd week of embryonic development and their molecular regulation. (10 marks)
- 3. Discuss the prenatal diagnosis and fetal therapy.

(10 marks)

4. A. Explain the differentiation of bones and joints of limbs.

(4 marks)

B. Explain the ribs and sternum developmental defects.

- (2 marks)
- **5. Discuss** the development of diaphragm and **outline** its clinical correlates.

(4.5 marks)

- **6. A. Explain** the development of the atrioventricular valves and their clinical correlates.
 - (4 marks)

B. Discuss the arterial system defects.

(4 marks)

C. Explain the fate and derivatives of vitelline veins.

- (2 marks)
- 7. A. Illustrate in table the time and characters of stages of lung maturation.
 - (2.5 marks)
 - B. Explain herniation, rotation and retraction of midgut intestinal loop.
- (7 marks)
- 8. A. Discuss the molecular regulation of the kidney development.
- (3 marks)
- B. Explain development of vagina and outline uterine and vaginal defects. (6 marks)

EMBRYOLOGY (1st SEMESTER MASTER)

MCQ (25 marks)

- 1. Primitive streak is initiated & maintained by which of the following genes?
 - a. Nodal gene
 - b. BMP4
 - c. FGF
 - d. Brachyury gene
- 2. Which of the following is NOT derived from neural crest?
 - a. Melanocytes
 - b. Schwann cells
 - c. Thyroid follicular cells
 - d. Parafollicular C cells
- 3. Which of the following substances cross the placental membrane?
 - a. IgG
 - b. IgA
 - c. IgM
 - d. IgE
- 4. Which of the following vessels disappear in umbilical cord during its development?
 - a. Left umbilical artery
 - b. Left umbilical vein
 - c. Right umbilical artery
 - d. Right umbilical vein
- 5. Oogenesis, the process that creates female gametes, is halted at prophase I until puberty. Which of the following describes the DNA content of a female's gametes during her childhood?
 - a.46 chromosomes, 46 chromatids
 - b.46 chromosomes, 92 chromatids
 - c.23 chromosomes, 46 chromatids
 - d.23 chromosomes, 23 chromatids

- 6. Oogenesis and spermatogenesis describe the process of meiosis in females and males respectively. What statement about the two processes is true?
 - a. Oogenesis forms two polar bodies while spermatogenesis only forms one
 - b. Oogenesis produces a larger gamete than spermatogenesis
 - c. Both produce the same number of viable gametes
 - d. Both are halted in an intermediate step until puberty
- 7. Colchicine is a drug used to treat gout. It also arrests cells in anaphase. Which of the following cytoskeletal proteins does colchicine affect?
 - a. Actin
 - b. Myosin
 - c. Tubulin
 - d. Cadherin
- 8. A radioactive marker was applied to the mesoderm of a mammalian embryo. Which tissues or organs would have this marker in the adult?
 - a. Intestines
 - b. Brain
 - c. Epidermis of the skin
 - d. Bones and muscles
- 9. Which embryological stage divides the embryo into two halves establishing bilateral symmetry in mammals?
 - a. Neurulation
 - b. Blastulation
 - c. Cleavage
 - d. Organogenesis
- 10. What would be the correct order of the following events during fertilization?
 - 1. Digestion of zona pellucida by acrosomal enzymes
 - 2. Sperm bypasses corona radiata
 - 3. Cortical granules release enzymes
 - 4. Sperm binding with vitelline membrane
 - **a.** 2,3,4,1
 - **b.** 3,2,4,1
 - **c.** 2,1,3,4
 - **d.** 1,3,2,4

- 11. Which of the following bones of chondrocranium is derived from the neural crest cells?
 - a. Anterior part of greater wing of sphenoid
 - b. Posterior part of greater wing of sphenoid
 - c. Petrous part of temporal
 - d. Basilar part of occipital
- 12. Which of the following types of congenital craniocynostosis is characterized by premature closure of all sutures of skull with growth of brain through anterior and sphenoid fontanelles?
 - a. Brachycephaly
 - b. Plagiocephaly
 - c. Scaphocephaly
 - d. Kleeblateschadel
- 13. Which of the following structures is the origin of smooth muscles of dorsal aorta?
 - a. Lateral plate mesoderm
 - b. Lateral plate mesoderm and neural crest cells
 - c. Proepicardial cells& neural crest cells
 - d. Surface ectoderm
- 14. During patterning of skeletal muscles, the connective tissues that receive migrating myoblast are derived from somatic mesoderm in which of the following regions of the body?
 - a. Head region
 - b. Cervical region
 - c. Body wall
 - d. Limbs
- 15. Which of the following transcription factors plays a role in deposition and function of extracellular matrix molecules that control cardiac looping?
 - a. BMP 2
 - b. PITX2
 - **c.** NKX 2.5
 - d. TBX5

- 16. Which of the following parts of developing heart originates from secondary heart field (SHF)?
 - a. Left atrium
 - **b.** Right atrium
 - c. Outflow tract
 - d. Left ventricle
- 17. A newly born baby was diagnosed to have interrupted aortic arch with an abnormal origin of right subclavian artery. Obliteration of which of the following embryologic arterial systems is the cause of this anomaly?
 - a. Left fourth aortic arch
 - b. Right fourth aortic arch
 - c. Both fourth aortic arches
 - d. Distal portion of right dorsal aorta
- 18. Which of the followings is the action of crista dividens?
 - a. Allows saturated blood to pass from right atrium to left atrium
 - b. Prevents excess saturated blood to pass from right atrium to left atrium
 - c. Prevents saturated blood to pass from right atrium to right ventricle
 - d. Allows excess desaturated blood to pass from SVC to right atrium
- 19. Dilatation of which of the followings is most likely the cause of congenital cysts of the lung?
 - a. Alveoli
 - **b.** Respiratory bronchiols
 - c. Terminal sacs
 - d. Terminal or larger bronchi
- 20. Which of the following transcription factors specifies development of the duodenum?
 - a. SOX2
 - b. DPX1
 - c. CDXA
 - d. CDXC

21. Which is the most common time of development of pyloric stenosis?

- a. During fetal life
- b. At birth
- c. 1-2 days after birth
- d. 3-5 days after birth

22. Which of the following is most likely the character of congenital gastroschisis?

- a. It is most likely due to abnormal closure of body wall around connecting stalk
- b. It is a herniation of the abdominal viscera through the umbilical ring
- c. The viscera included like stomach spleen, gall bladder is covered by amnion
- d. It is associated with chromosomal abnormalities and other severe defects

23. At which week of development, differentiation of the glomerular capillaries in the nephrons start to form?

- **a.** 9th
- **b.** 10th
- c. 12th
- **d.** 14th

24. Epigenital tubules form which of the following structures in adult male?

- a. Ductus deferens
- b. Efferent ductules
- c. Paradidymis
- d. Rete testis

25. Which of the following factors is correct during descent of the testis?

- a. Outgrowth of extra-abdominal portion of gubernaculum produces intraabdominal migration
- **b.**Outgrowth of intra- abdominal portion of gubernaculum produces migration into inguinal canal
- c. An increase in the intra-abdominal pressure produces intra-abdominal migration
- d. Regression of extra- abdominal portion of gubernaculum stops descent of testis

END OF THE EXAM

WITH MY BEST WISHES

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