

YR 1 HISTOLOGY/CELL BIOLOGY UNIT EXAM 4 -- December 16, 1996.

CHOOSE THE SINGLE BEST ANSWER FOR QUESTIONS 1 - 95.

QUESTIONS 1-47 ARE TO BE ANSWERED IN CONJUNCTION WITH THE SLIDES TO BE PROJECTED DURING THE EXAMINATION.

1. Identify:
 - A. Eccrine sweat gland
 - B. Seminiferous tubules
 - C. Distal convoluted tubules (kidney)
 - D. Apocrine sweat gland
 - E. Mammary gland

2. These cells:
 - A. Secrete renin
 - B. Secrete aldosterone
 - C. Trigger a response in juxtaglomerular cells
 - D. Trigger a response in mesangial cells
 - E. Are responsible for the acidification of urine

3. Which of the following statements is **INCORRECT**?
 - A. This anomaly occurs in males more than females
 - B. This anomaly is derived from the proximal portion of the yolk sac
 - C. This anomaly occurs in 2 to 4 out of 10,000 patients
 - D. This anomaly may mimic appendicitis
 - E. This anomaly may be connected to the umbilicus by a fistula

4. Identify:
 - A. Thick skin
 - B. Vagina
 - C. Rectum
 - D. Esophagus
 - E. Tongue (dorsal surface)
5. Identify the silver-stained tissue shown:
 - A. Woven-bone
 - B. Dense irregular connective tissue
 - C. Reticular connective tissue
 - D. Loose (areolar) connective tissue
 - E. Elastic cartilage
6. The ultrastructure of this cell is consistent with that of cells from all of the following **EXCEPT**:
 - A. Granulosa lutein cells of corpus luteum
 - B. Interstitial (Leydig) cells of testis
 - C. Zona fasciculata of adrenal cortex
 - D. Oxyphil cells of parathyroid
 - E. Theca interna cells of secondary follicle
7. Which of the following statements about embryos of this stage of development is **INCORRECT**?
 - A. The cells of this embryo are known as blastomeres
 - B. All of the cells of this embryo are equivalent
 - C. This embryo would normally be found in the oviduct
 - D. This embryo can compensate for the loss of one of its cells
 - E. This is the stage at which twinning most often occurs

8. When the uterine endometrium appears like this, all of the following are true of the female reproductive system **EXCEPT**:
- A. The predominate steroid hormone secreted from the ovary is estrogen
 - B. There is an increase in the height and relative number of ciliated cells in the oviduct
 - C. The lamina functionalis increases in thickness due to mitotic division of cells in the lamina basalis
 - D. The secretions of cervical glands are relatively thin, watery and abundant
 - E. The ovary contains an active corpus luteum in the cortex
9. This slide shows the presence of:
- A. Corpora arenacea
 - B. Primordial follicles
 - C. Corpus albicans
 - D. Pituicytes
 - E. Oxyphil cells
10. This cell :
- A. Is commonly found in the lamina propria of the small intestine
 - B. Secretes its product into the mucosal glands of the small intestine
 - C. Secretes a watery product conveyed to the oral cavity via an excretory duct
 - D. Contains phagocytized bacteria in its secondary lysosomes.
 - E. Is an acidophil from the pars distalis of the hypophysis

11. This cell actively synthesizes osteoid.
- A. Osteoblast
 - B. Osteocyte
 - C. Osteoprogenitor cell
 - D. Osteoclast
 - E. Mesenchymal cell
12. Major functions of the tall columnar cells found in this field include all of the following **EXCEPT**:
- A. The secretion of glycoproteins, sialic acid, and glycerophosphorylcholine necessary for spermatozoa maturation
 - B. The production of testosterone needed for spermatozoa to become independently motile
 - C. The digestion of residual bodies remaining from the process of spermiogenesis
 - D. The absorption of testicular fluid
 - E. The phagocytosis of abnormal spermatozoa
13. Identify:
- A. Esophagus
 - B. Stomach
 - C. Small intestine
 - D. Trachea
 - E. Bronchiole
14. Identify this structure
- A. Otocyst
 - B. Lens vesicle
 - C. Optic vesicle
 - D. Pharyngeal pouch
 - E. Rathke's pouch

15. This structure from the kidney is a:
- A. Renal corpuscle
 - B. Bowman's capsule
 - C. Proximal tubule
 - D. Distal tubule
 - E. Collecting duct
16. Cells of this type are found abundantly in all of the following places **EXCEPT**:
- A. The stroma of the prostate gland
 - B. The gap found in tracheal cartilages
 - C. The vaginal mucosa
 - D. The uterine wall
 - E. The wall of the ductus (vas) deferens
17. The structure indicated is derived from
- A. Endoderm
 - B. Intermediate mesoderm
 - C. Lateral mesoderm
 - D. Ectoderm
 - E. None of the above
18. The structure indicated possesses a ruffled border
- A. Osteoblast
 - B. Osteocyte
 - C. Mesenchymal cell
 - D. Osteoclast
 - E. Osteoprogenitor cell

19. Identify this gland:
- A. Brunner's gland
 - B. Submandibular gland
 - C. Pancreas
 - D. Parotid
 - E. Parathyroid
20. Identify:
- A. Thyroid
 - B. Testis
 - C. Pineal
 - D. Parathyroid
 - E. Suprarenal
21. The cell, whose nucleus is indicated, is engaged mainly in synthesizing:
- A. Proteolytic hydrolases and enzymes for phagocytosis
 - B. Plasma membrane and its associated proteins
 - C. Neurotransmitters and their synthetic enzymes
 - D. Secretory antibodies
 - E. Steroid-based hormones
22. This portion of the stomach is noted for its:
- A. Proximity to the esophagus
 - B. Production of pepsinogen
 - C. Numerous gastrin producing cells
 - D. Population of goblet cells
 - E. Synthesis of enterokinase

23. Identify:
- A. Spleen
 - B. Lymph node
 - C. Tonsil
 - D. Thymus
 - E. Peyer's patch
24. The anomaly illustrated on this slide:
- A. Results from failure to fuse
 - B. Occurs between two pharyngeal arch derived structures
 - C. Is the result of insufficient neural crest migration
 - D. All of the above are true
 - E. None of the above are true
25. Molecules passing through this channel may come into direct contact with all of the following **EXCEPT**:
- A. Hepatocyte
 - B. Kupffer cell
 - C. Endothelial cell
 - D. Cell of Ito (lipid-storing cell)
 - E. Bile canaliculus
26. Identify the indicated structures:
- A. Muscular artery and vein
 - B. High endothelial venules
 - C. Mammary gland alveoli
 - D. Thyroid follicles with colloid
 - E. Peripheral nerve bundles

27. In this silver preparation, the stained structures are:
- A. Epithelial reticular processes in the thymus
 - B. Stromal components of a lymph node
 - C. Enteroendocrine cells (and their processes) of the small intestine
 - D. Axons and motor endplates in skeletal muscle
 - E. Reticular fibers around sinusoids in the spleen
28. Identify:
- A. Spleen
 - B. Lymph node
 - C. Tonsil
 - D. Thymus
 - E. Peyer's patch
29. All of the following are true about the brown stained cell **EXCEPT** the cells:
- A. Are epithelial cells.
 - B. Form specialized tight junctions between each other.
 - C. Obtain physical and biochemical support from male germ cells.
 - D. Form specialized junctions with spermatocytes and spermatids.
 - E. Are responsible for the blood-testis barrier.
30. The cells and their processes indicated:
- A. Absorb fluid in the efferent ductules
 - B. Propel mucus in the trachea toward the oral cavity
 - C. Absorb products of digestion in the small intestine
 - D. Help move the oocyte and its associated cells along the oviduct
 - E. Transduce the auditory signal in the organ of Corti

31. This tissue:
- A. Contains Purkinje fibers, cells responsible for the conduction of nervous impulses
 - B. Possesses intercalated discs at the ends of individual cells
 - C. Is a component of the muscularis externa of organs of the digestive system
 - D. Consists mainly of multi-nucleated cells under voluntary (conscious) control
 - E. Contains only keratin intermediate filament proteins
32. The indicated portion of the organ illustrated
- A. Is composed of two layers of pigmented epithelial cells
 - B. Is attached to the lens via zonule (suspensory ligament) fibers
 - C. Performs most of the refraction of incoming light to the retina
 - D. Was derived mainly from surface ectoderm
 - E. Is part of the fibrous layer (tunic) of the eye
33. This cell from the lung:
- A. Provides a lubricant for bronchioles
 - B. Patrols the luminal surface of alveolar air spaces
 - C. Is necessary for the patency of alveoli
 - D. Is found in decreasing numbers below the bronchus/bronchiole border.
 - E. Is a brush cell

34. This follicle DOES **NOT** contain:
- A. Liquor folliculi.
 - B. Steroid producing cells.
 - C. A primary oocyte.
 - D. Corpora luteal cells.
 - E. A basement membrane.
35. The cartilage indicated differs from most hyaline cartilage because it:
- A. Contains isogenous groups of cells interstitially
 - B. Lacks a perichondrium
 - C. Lacks blood vessels
 - D. Contains type II collagen
 - E. Is derived from mesenchyme
36. This structure, whose lumen is shown at the asterisk, illustrates a:
- A. Bronchus
 - B. Bronchiole
 - C. Terminal bronchiole
 - D. Respiratory bronchiole
37. The morphology of the cell shown indicates that it is:
- A. A type of phagocytic cell
 - B. Releasing secreted protein via exocytosis
 - C. In the early stage of mitosis
 - D. An actively migrating cell
 - E. Involved in processing secretory IgA

38. This organ is the source of:
- A. Trypsin
 - B. Saliva
 - C. Tears
 - D. Parathyroid hormone
 - E. Pepsin
39. The formation of the indicated structures would involve all of the following organelles **EXCEPT**:
- A. Primary lysosomes
 - B. Golgi apparatus
 - C. Nucleus
 - D. Rough endoplasmic reticulum
 - E. Peroxisomes
40. This structure gives produces or substantially contributes to all of the following **EXCEPT** the:
- A. Neural retina
 - B. Ciliary body epithelium
 - C. Pigment epithelium
 - D. Optic nerve
 - E. Corneal stroma
41. This slide shows an organ which may exhibit all of the following **EXCEPT**:
- A. Central lacteals
 - B. M (microfold) cells
 - C. Peyer's patches
 - D. Paneth cells
 - E. Gastric pits

42. All of the following are **TRUE** regarding the organelle shown **EXCEPT**:
- A. Has an inner membrane which is a site of attachment for elementary particles
 - B. Contains cristae which are morphologically different between steroid and protein producing cells
 - C. Often located near basal striations of cells involved in active transport of ions
 - D. Is specialized for the regulated release of calcium ions in striated muscle
 - E. Contains DNA to encode for a small number of resident proteins
43. This structure:
- A. Reabsorbs the majority of the glomerular filtrate.
 - B. Contains a single type of epithelial cell.
 - C. Exhibits extensive lateral interdigitations.
 - D. Forms part of the juxtaglomerular apparatus.
 - E. Is highly responsive to antidiuretic hormone (ADH)
44. The cell indicated functions MAINLY in:
- A. Producing and releasing a serous salivary secretion
 - B. Receiving and conducting neurochemical signals
 - C. Producing and releasing testosterone
 - D. Secreting antibodies such as IgA and IgG
 - E. Phagocytizing bacteria and degenerating cells

45. This organelle contains all of the following **EXCEPT**:
- A. Functional ribosomes
 - B. mRNA
 - C. Histones
 - D. Lamins
 - E. Euchromatin

MATCHING ITEMS

Directions: Select the option (A-G below) which best fits the descriptions numbered 46-47.

- A. Zonula adherens
- B. Zonula occludens
- C. Tight junction
- D. Gap junction
- E. Basal striations
- F. Desmosome
- G. Hemidesmosome

- 46. This structure (shown in a freeze fracture preparation) allows conduction of ions between cells.
- 47. This structure is located between epithelial cells, and has associated cytokeratin filaments.

END OF SLIDE PORTION OF EXAM. PLEASE CONTINUE.

48. Passage of materials through the filtration barrier in the kidney is influenced by all of the following **EXCEPT**:
- A. Thickness of the trilaminar basement membrane
 - B. Presence of negatively charged molecules such as heparan sulfate within the lamina rara layers
 - C. The anionic charge associated with the glycocalyx of podocyte foot processes
 - D. The ability of mesangial cells to phagocytize debris which accumulates within the glomerular basement membrane
 - E. A pressure gradient caused by the afferent arteriole being smaller in diameter than the corresponding efferent arteriole
49. The three protein networks that make up the cytoskeleton are classified as:
- A. Intermediate filaments, microfilaments, microtubules
 - B. Thin filaments, thick filaments, Z-lines
 - C. Collagen fibrils, reticular fibers, elastic fibers
 - D. Laminin filaments, collagen type IV fibers, proteoglycan fibers
 - E. Cilia, centrioles, basal bodies
50. Which of the following pairs of tissues is **NOT** involved in an inductive interaction?
- A. Notochord - neuroectoderm
 - B. Optic vesicle - lens placode
 - C. Germ cells - gonad
 - D. Brain - calvaria
 - E. Inner cell mass - trophoblast

51. Indicate the **INCORRECT** statement:
- A. The human pineal gland, through its hormone melatonin, appears to relate light duration/intensity to endocrine activity
 - B. Pinealocytes and interstitial glial cells are the basic types of cells found in the pineal
 - C. Hypothalamic signals trigger the synthesis and secretion of hormones in the adenohypophysis (somatotropin, prolactin, and thyrotropin among others)
 - D. The pituicyte is the only cell type specific to the neurohypophysis
 - E. The pars intermedia of the hypophysis synthesizes oxytocin and antidiuretic hormone (ADH) as its main products
52. Sensory cells of the taste buds and the olfactory mucosa share all of the following properties **EXCEPT**:
- A. Provide for sensory transduction of chemical stimuli
 - B. Are part of a renewable epithelium
 - C. Are associated with supporting cells
 - D. Make synaptic contacts with neuronal elements
 - E. Extend axonal processes into the brain
53. All of the following will aid in the distribution of nutrients and other products to osteocytes, **EXCEPT**:
- A. Gap junction
 - B. Cell processes
 - C. Haversian canals
 - D. Canaliculi
 - E. Bone matrix

54. Each of the following matches is CORRECT **EXCEPT**:
- A. Ligamentum teres hepatis - left umbilical vein
 - B. Smooth walled part of left atrium - left horn of sinus venosus
 - C. Aortic vestibule of left ventricle - bulbus cordis
 - D. Floor of fossa ovalis - septum primum
 - E. Infundibulum of right ventricle - bulbus cordis
55. Choose the **INCORRECT** match with respect to the liver:
- A. Portal triad - interlobular branches of the portal vein, hepatic artery and bile duct.
 - B. Portal canal - connective tissue space which contains the elements of a portal triad.
 - C. Portal lobule - Hepatic tissue which contributes bile to a single bile duct.
 - D. Classic lobule - hexagonal lobule with sinusoids extending radially from a central vein.
 - E. Functional lobule - acinar unit based on the terminal branches of the hepatic artery and hepatic vein.
56. Which of the following cells of the peripheral blood is mobilized most rapidly to fight bacterial infection?
- A. Erythrocyte
 - B. Platelet
 - C. Neutrophil
 - D. Eosinophil
 - E. Basophil

57. At mid-gestation, the most essential region of the decidua for exchange of nutrients between the maternal and fetal circulatory systems is the decidua:
- A. Parietalis
 - B. Capsularis
 - C. Basalis
 - D. Laeve
58. All of the following statements regarding the suprarenal gland are CORRECT **EXCEPT**:
- A. The zona fasciculata and zona reticularis are the only regions which are critically dependent upon the adenohipophysis.
 - B. The zona glomerulosa plays an important role in the regulation of ion levels in the urine.
 - C. The zona reticularis is the major site of cortisol production.
 - D. Corticosteroid-rich venous blood from the adrenal cortex serves to regulate secretion from the adrenal medulla.
 - E. Adrenal medullary cells are analogous to postganglionic sympathetic neurons with regard to their products and innervation.
59. The smooth endoplasmic reticulum is necessary for all of the following cellular functions **EXCEPT**:
- A. Synthesis of biological membrane lipoproteins
 - B. Detoxification of lipid soluble drugs
 - C. Synthesis of steroid hormones
 - D. Striated muscle contraction
 - E. Inactivation of hydrogen peroxide

60. Which of the following principles of teratology is **INCORRECTLY** stated?
- A. Susceptibility to teratogenesis depends upon the genotype of the conceptus and its interaction with environmental factors.
 - B. Susceptibility to a given teratogenic agent is high throughout embryonic development.
 - C. Agents act in specific ways on developing cells and tissues to initiate abnormal embryogenesis.
 - D. The final manifestations of abnormal development are death, malformation, growth retardation, and functional disorder.
 - E. Access of adverse environmental influences to developing tissues depends on the nature of the influence/agent.
61. All of the following statements about the kidney are **CORRECT EXCEPT**:
- A. A renal corpuscle consists of a glomerulus plus Bowman's capsule.
 - B. A nephron includes Bowman's capsule, proximal tubule, thin limb, distal tubule and collecting duct.
 - C. Medullary rays contain parallel profiles of proximal and distal tubules and collecting ducts.
 - D. Cortical tissue may extend into the medulla as cortical columns.
 - E. Transitional epithelium begins at the level of minor calyces.

62. Choose the **INCORRECT** pair regarding the male reproductive tract:
- A. Seminal vesicle - contains the initial portion of the urethra and the ejaculatory ducts
 - B. Vas (ductus) deferens - identifiable by the thick muscularis of three layers of smooth muscle
 - C. Prostate gland - characterized histologically by the presence of concretions and a fibromuscular stroma
 - D. Stereocilia - non-motile microvilli associated with the apical surface of cells lining the epididymal duct
 - E. Ductuli efferentes - contain cuboidal epithelial cells which function to absorb some testicular fluid
63. Which of the following anomalies is **NOT** a malformation of the skeletal system?
- A. Spina bifida
 - B. Achondroplasia
 - C. Craniosyntosis
 - D. Meromelia
 - E. Omphalocele
64. The vascular organization of the kidney includes all of the following **EXCEPT**:
- A. Blood from the efferent arterioles of subcapsular glomeruli flows into peritubular capillaries which are characterized by open fenestrae.
 - B. Interlobular arteries are located in the cortex between medullary rays.
 - C. Interlobar arteries are located in the medulla between pyramids.
 - D. Blood from the efferent arterioles of juxtamedullary glomeruli flows into vasa rectae which descend into a capillary plexus within the medulla.
 - E. Venous blood from both cortex and medulla flows in arcuate veins en route to interlobar vessels.

65. Protein X is a component of the plasma membrane. Protein X can be removed from the plasma membrane only by destroying the membrane bilayer with strong detergents. Based on this information, Protein X could be classified as all of the following **EXCEPT**:
- A. Glycoprotein
 - B. Peripheral membrane protein
 - C. Receptor protein
 - D. Transmembrane protein
 - E. Integral membrane protein
66. Which of the following congenital defects of the heart would result directly from failure of formation of the aortico-pulmonary septum?
- A. Coarctation of the aorta
 - B. Interatrial septal defect
 - C. Transposition of the great vessels
 - D. Dextrocardia
 - E. Persistent truncus arteriosus
67. All of the following are TRUE of the integumentary system **EXCEPT**:
- A. Melanocytes are pigment-producing cells of neural crest origin whose product (melanin) develops its color by oxidation of tyrosine to DOPA
 - B. Langerhans cells are antigen presenting cells located in the dermis
 - C. Hairs are composed of keratinized cells that develop from hair follicles
 - D. Eccrine sweat glands are simple coiled glands whose main function is body temperature regulation
 - E. The skin is well supplied with nerve endings to blood vessels, arrector pili muscles and both eccrine and apocrine sweat glands

68. Which of the following statements is true of fibrocartilage:
- A. It exhibits large amounts of elastic fibers.
 - B. It possesses a perichondrium.
 - C. It is the prototypic cartilage in the epiphyses of the long bones of infants.
 - D. It contains mainly type III collagen.
 - E. It is structurally intermediate between cartilage and dense irregular connective tissue.
69. In the production of secretory IgA, the enterocyte is responsible for all of the following **EXCEPT**:
- A. Dimerization of IgA
 - B. Receptor mediated endocytosis
 - C. Vesicular transport (transcytosis)
 - D. Modification of IgA
 - E. Exocytosis at the luminal surface
70. Which of the following structures does **NOT** contain endodermal derivatives?
- A. Spleen
 - B. Pancreas
 - C. Liver
 - D. Thyroid
 - E. Thymus
71. **Abnormal** functioning of the Golgi apparatus would result in **abnormal** synthesis of:
- A. Urate oxidase by hepatocytes
 - B. Tubulin by epidermal cells
 - C. Pepsinogen by chief cells
 - D. Actin by enterocytes
 - E. Glycogen by skeletal muscle cells

72. All of the following are TRUE regarding the testis EXCEPT:
- A. The testis is a compound tubular gland, with spermatozoa as the secretion product
 - B. The mediastinum testis is a thickening of the connective tissue capsule, and contains the rete testis
 - C. Tubuli recti, contained within the testis, represent the initial segment of the excretory duct system
 - D. Leydig cells not only secrete testosterone, but form part of the blood-testis barrier
 - E. Seminiferous tubules are lined with an epithelium consisting of Sertoli cells and spermatogenic cells
73. Which of the following statements about the thymic cortex is CORRECT?
- A. It contains both capillaries and post-capillary venules.
 - B. It contains Hassall's corpuscles.
 - C. It contains mesenchymally derived reticular cells and fibers.
 - D. It is the site of the blood-thymus barrier.
 - E. It contains prominent germinal centers.
74. The urinary bladder is:
- A. Derived from the urogenital sinus
 - B. Formed from endoderm and mesoderm
 - C. Connected to the umbilical cord by the urachus
 - D. All of the above
 - E. None of the above

75. You have been funded by the National Cancer Institute to study a receptor that you believe is essential for metastasis and cell migration. You plan to use the embryonic mouse as a model system in which to study cell migration and you have genetically engineered a mouse in which the receptor is missing. Which of the following tissues would you expect to be **LEAST** affected by the deficit?
- A. Enteric plexus
 - B. Thymus
 - C. Adrenal medulla
 - D. Liver
 - E. Gonads
76. In addition to surfactant, the gas exchange barrier in the lung at its thinnest location consists of:
- A. Squamous alveolar cell, basal lamina of squamous alveolar cell, basal lamina of endothelial cell, fenestrae of endothelial cell.
 - B. Squamous alveolar cell, trilaminar basement membrane, endothelial cell.
 - C. Squamous alveolar cell, basal lamina of squamous alveolar cell, basal lamina of endothelial cell, endothelial cell.
 - D. Squamous alveolar cell, discontinuous basal laminae, cytoplasm of endothelial cell.
77. Indicate the **INCORRECT** statement:
- A. Thyroglobulin is the inactive storage form of some thyroid hormones
 - B. The synthesis, storage and release of thyroid hormones are controlled by thyroid-stimulating hormone (TSH) released by the adenohypophysis
 - C. Certain hormones from the thyroid and parathyroid are functionally linked through their reciprocal control of serum calcium levels
 - D. The parathyroid gland produces calcitonin, a hormone that increases blood calcium levels
 - E. The thyroid produces hormones with an essential role in normal fetal development and in metabolism regulation

78. All of the following are associated with pharyngeal arch II
EXCEPT:
- A. Muscles of mastication
 - B. Stapedial artery
 - C. Cranial nerve VII
 - D. Tonsillar cleft for palatine tonsil
 - E. Part of the hyoid bone
79. Each of the following events or structures is matched with the approximate period during which it occurs. Which event is **INCORRECTLY** matched?
- A. Two-cell embryo - second day post-fertilization
 - B. Implantation - end first week post-fertilization
 - C. Primitive streak - second week post-fertilization
 - D. Physiological umbilical herniation - 6 to 10 weeks post-fertilization
 - E. Appearance of surfactant - 24 weeks post-fertilization
80. All of the following statements about eccrine glands are CORRECT, **EXCEPT:**
- A. They may be exocrine glands.
 - B. They may be endocrine glands.
 - C. They may contain a well-developed Golgi apparatus.
 - D. They may lose their apical cytoplasm upon secretion.
 - E. They may have a well-developed rough endoplasmic reticulum.

81. A rare (very uncommon) urogenital anomaly:
- A. Horseshoe kidney
 - B. Hypospadias
 - C. Epispadias
 - D. Anomalous renal blood vessels
 - E. All of the above are rare (very uncommon)
82. Each of the following structures is matched with an early embryonic tissue from which it is wholly or partially derived. Which match is **INCORRECT**?
- A. Chorionic villus - trophoblast
 - B. Neurohypophysis - Rathke's pouch
 - C. Stomach - splanchnopleure
 - D. Vertebrae - sclerotome
 - E. Kidney - intermediate mesoderm
83. Synthesis and assembly of mature collagen fibers with ~67nm periodicity involves:
- A. The rough endoplasmic reticulum
 - B. Golgi apparatus
 - C. Transfer vesicles
 - D. Extracellular space
 - E. All of the above
84. Pharyngeal Arch I gives rise to:
- A. Lateral palatine processes
 - B. Nasal septum
 - C. Primary palate
 - D. All of the above
 - E. None of the above

85. Choose the **CORRECT** statement regarding the mammary gland:
- A. During lactation, the lobules of the gland consist only of duct elements and abundant dense irregular connective tissue
 - B. The alveoli of the proliferative gland are lined with a simple columnar epithelium of ciliated cells and peg cells
 - C. Colostrum, or first milk, contains immunoglobulins that can confer passive immunity to the newborn
 - D. Myoepithelial cells, which function in the movement of milk from alveoli to ducts, are stimulated to contract by estrogen
 - E. The lipid component of milk is released from the alveolar cells by exocytosis of secretory granules
86. The trigone of the urinary bladder:
- A. Is derived from intermediate mesodermal structures
 - B. Gives rise to the lower 1/3 of the vagina
 - C. Is formed upon incorporation of the caudal ends of the mesonephric ducts into the urogenital sinus
 - D. All of the above
 - E. None of the above
87. Choose the **INCORRECT** pair regarding the circulatory system:
- A. Postcapillary venules - site of blood-tissue exchange
 - B. Sinoatrial node - pacemaker cells of heart
 - C. Aorta - elastic artery
 - D. Continuous capillary - myoendothelial cell junctions
 - E. Endocardium - equivalent to tunica intima

88. Which statement is **FALSE** in regard to genital differentiation?
- A. Sertoli cells produce Müllerian Inhibiting Substance (MIS) which causes paramesonephric ducts to degenerate
 - B. Seminiferous cords do not cavitate until puberty
 - C. Spermatogonia are derived from endoderm
 - D. Mesonephric tubules become rete testis
 - E. Male genital differentiation occurs more quickly than female differentiation
89. Which statement is **FALSE** in regard to metanephric development?
- A. The entire functional part of the metanephroi develops from intermediate mesoderm structures
 - B. The excretory part of the metanephroi develops before the collecting part
 - C. Metanephrogenic vesicles form from the caudal part of the nephrogenic cord
 - D. The ureteric bud is an evagination of the mesonephric duct
 - E. Metanephroi are fully functional by week 11.

MATCHING ITEMS

In each of the following groups there are two numbered lists. Mark on the answer sheet in the line corresponding to each question number in the lower list (90-95) the letter of the related item of the upper list.

DIRECTIONS: Select the option (A-H below) which best fits the description numbered 90.

- A. Germinal centers
- B. Periarteriolar lymphatic sheath
- C. Crypts of the tonsil
- D. Hassall's corpuscles
- E. Medium-sized lymphocyte
- F. Lymphoblasts
- G. Medullary cords of lymph node
- H. Cords of Billroth

90. This structure may be described as "B" cell dependent.

DIRECTIONS:

Select the option (A-P below) which best fits the descriptions numbered 91-93.

- A. Dendrite
- B. Sarcomere
- C. Synaptic vesicles
- D. Terminal bar
- E. Nissl body
- F. Synapse
- G. Occluding zonule
- H. Axon
- I. Junctional fold
- J. Myofibril
- K. Desmosome
- L. Intercalated disc
- M. Motor endplate
- N. Gap junction
- O. Transverse (T-) tubule
- P. Z-line

- 91. The portion of the neuron which is specialized for conduction of the action potential
- 92. The membrane specialization found between smooth muscle cells
- 93. A junctional complex found in cardiac muscle but not in skeletal muscle

DIRECTIONS:

Select the option (A-M below) which best fits the descriptions numbered 94-95.

- A. Stria vascularis
- B. Semicircular duct
- C. Organ of Corti
- D. Cerebrospinal fluid
- E. Ciliary muscle
- F. Crista ampullaris
- G. Lens fiber cells
- H. Vitreous body
- I. Canal of Schlemm
- J. Perilymph
- K. Cornea
- L. Endolymph
- M. Macula

94. Composed mostly of hyaluronic acid and collagenous fibers

95. A fluid with a high potassium concentration relative to its sodium concentration