

#1 - #96 MULTIPLE CHOICE QUESTIONS:

CHOOSE THE ONE BEST ANSWER AND MARK IT ON THE ANSWER SHEET

1. Which of the following CANNOT be resolved as separate objects using a light microscope:

- a) two mitochondria
- b) two platelets
- c) two capillaries
- d) two endothelial cells
- e) two endothelial fenestrations

2. Which of the following is MOST readily stained by eosin:

- a) plasmamembrane
- b) nuclear membrane
- c) basement membrane
- d) DNA
- e) RNA

3. Which of the following best describes the colour of inflammatory cells in the dermis that are stained by hematoxylin:

- a) red
- b) blue
- c) green
- d) brown
- e) black

4. Which of the following is the MOST electron dense structure in an inflammatory cell:

- a) vesicle at the cis-face of the golgi
- b) vesicle at the trans-face of the golgi
- c) golgi saccule
- d) euchromatin
- e) heterochromatin

5. A fluorescently-labelled antibody that binds an epitope within glucagon will label:

- a) centroacinar cells of the pancreas
- b) acinar cells of the pancreas
- c) islet cells of the pancreas
- d) epithelial cells that line the pancreatic ducts
- e) cells that actively absorb glucose in the liver

6. Which of the following BEST describes the cystic fibrosis transmembrane regulator in the pancreas:

- a) peripheral membrane protein
- b) integral membrane protein
- c) cytoskeletal protein
- d) ground substance protein
- e) hormone

7. Which of the following have the MOST prominent smooth endoplasmic reticulum:

- a) ciliated tracheal epithelial cells
- b) lutein cells of the corpus luteum
- c) astrocytes
- d) lymphocytes
- e) oocytes

8. Which of the following do NOT contain nuclear pore complexes:

- a) myoblasts
- b) myocytes
- c) erythroblasts
- d) erythrocytes
- e) fibroblasts

9. Which of the following is NOT involved in moving cargo along an axon:

- a) tubulin
- b) myosin
- c) microtubules
- d) kinesin
- e) dynein

10. Which of the following is NOT derived from endoderm:

- a) enterocytes of the small intestine
- b) unicellular mucous glands of the tracheal epithelium
- c) enteroendocrine cells of the small intestine
- d) proximal tubule cells of the kidney
- e) goblet cells of the large intestine

11. Which of the following can be derived from more than one primary germ layers:

- a) epithelial tissue
- b) nervous tissue
- c) connective tissue
- d) endothelium
- e) lymphocytes

12. Which of the following BEST defines an epithelial tissue:

- a) large amount of extracellular matrix and few cells
- b) small amount of extracellular matrix and many cells
- c) presence of proliferating cells and absence of a surrounding lamina densa
- d) absence of proliferating cells and presence of a surrounding lamina densa
- e) epithelia are highly vascular

13. Which of the following contains MORE THAN one type of basic tissue:

- a) skin
- b) epidermis
- c) endothelium
- d) ependyma
- e) mesothelium

14. Which of the following BEST defines a 'simple' multicellular exocrine gland that is NOT branched:

- a) absence of ducts
- b) presence of one duct
- c) presence of multiple ducts that are lined by a simple epithelium
- d) presence of a serous secretory portion only
- e) presence of both serous and mucous secretory portions that produce a simple product

15. Which of the following can be 'fixed' OR 'transient' in connective tissue:

- a) fibroblasts
- b) mast cells
- c) macrophages
- d) plasma cells
- e) adipocytes

16. Regarding connective tissue proper, which of the following is TRUE:

- a) loose connective tissue has more collagen than dense connective tissue
- b) dense connective tissue has fewer cells than loose connective tissue
- c) dense regular connective tissue has more cells than dense irregular connective tissue
- d) dense irregular connective tissue has more fibers than dense regular connective tissue
- e) only loose connective tissue has ground substance

17. Which of the following is NOT a connective tissue:

- a) blood
- b) bone
- c) cartilage
- d) muscle
- e) epimysium

18. Regarding cartilage, which of the following is FALSE:

- a) fibrocartilage has collagen fibers
- b) hyaline cartilage has collagen fibers
- c) fibrocartilage has no distinct perichondrium
- d) hyaline cartilage has no distinct perichondrium
- e) elastic cartilage has collagen fibers and elastic fibers

19. In bone, OSTEONS are located in:

- a) periosteum
- b) compact bone
- c) spongy bone
- d) endosteum
- e) bone marrow

20. Which of the following BEST distinguishes smooth muscle from all other muscle types:

- a) the absence of sarcomeres in smooth muscle cells
- b) the absence of intercalated discs in smooth muscle cells
- c) the presence of centrally located nuclei in smooth muscle cells
- d) the presence of actin in smooth muscle cells
- e) the presence of myosin in smooth muscle cells

21. When a skeletal muscle contracts, which of the following occurs:

- a) sarcomeres shrink
- b) sarcomeres stretch
- c) sarcomeres increase in number
- d) myofibers proliferate
- e) satellite cells apoptose (ie. undergo programmed cell death)

22. Regarding cardiac muscle cells, which of the following is FALSE:

- a) multinucleate
- b) branched
- c) contain sarcomeres
- d) form junctions between the cells
- e) can be specialized for electrical conduction

23. After normal peripheral blood is centrifuged, granulocytes are located in the:

- a) top layer
- b) plasma
- c) buffy coat
- d) hematocrit
- e) bottom layer

24. Which of the following are LEAST often present in normal blood:

- a) lymphoblasts
- b) erythroblasts
- c) granulocytes
- d) agranulocytes
- e) platelets

25. In large blood vessels, where are the vasa vasorum located:

- a) tunica media
- b) tunica adventitia
- c) tunica intima
- d) in the tunica media and the tunica adventitia
- e) in all three tunics

26. Which of the following BEST distinguishes a medium-sized artery from a medium-sized vein:

- a) presence of a simple endothelium in the vein
- b) prominent layers smooth muscle in the tunica media of the artery
- c) prominent folds of the tunica media that form valves in the vein
- d) complete lack of a tunica adventitia in the artery
- e) complete lack of white blood cells within the lumen of the vein

27. Where does diapedesis most often occur:

- a) in fenestrated capillaries
- b) in arterioles
- c) in venules
- d) in arteries
- e) in veins

28. Which of the following is NOT present in a heart valve:

- a) dense regular connective tissue
- b) collagen
- c) elastin
- d) cardiac myocytes
- e) endothelial cells

29. Regarding the dendrites of neurons, which of the following is FALSE:

- a) contain microtubules
- b) contain mitochondria
- c) contain pre-synaptic vesicles
- d) conduct electrochemical impulses toward the neuronal cell body
- e) are present in both the central and the peripheral nervous systems

30. A fluorescently-labelled antibody that binds an epitope within 'glial fibrillary acidic protein' (GFAP) will label:

- a) axons
- b) neuronal cell bodies
- c) neuronal intermediate filaments
- d) neural capillaries
- e) astrocytes

31. The INNERMOST layer of connective tissue covering the brain is the:

- a) dura mater
- b) pia mater
- c) arachnoid mater
- d) endoneurium
- e) myelin

32. Which of the following myelinates the axons of peripheral nerves:

- a) Schwann cells
- b) oligodendrocytes
- c) microglia
- d) ependymal cells
- e) endoneurial cells

33. Which of the following does NOT bind to a nuclear receptor in target cells:

- a) cortisol
- b) aldosterone
- c) adrenaline
- d) triiodo-thyronine (T3)
- e) thyroxine (T4)

34. Which of the following are NOT part of the parenchyma of the anterior pituitary gland:

- a) acidophils
- b) basophils
- c) oxyphils
- d) chromophobes
- e) folliculostellate cells

35. Which of the following is synthesized in the paraventricular nucleus of the hypothalamus:

- a) parathyroid hormone
- b) adrenocorticotrophic hormone (ACTH)
- c) corticotropin-releasing hormone (CRH)
- d) growth hormone (GH)
- e) prolactin

36. Regarding the thyroid gland, which of the following is TRUE:

- a) follicular cells form a simple epithelium
- b) follicular cells synthesize calcitonin
- c) parafollicular cells contact the colloid
- d) parafollicular synthesize thyroglobulin
- e) stroma contains sinusoidal capillaries

37. Which of the following is MOST centrally located in the adrenal gland:

- a) chromaffin cells
- b) zona glomerulosa cells
- c) zona fasciculata cells
- d) zona reticularis cells
- e) capsular cells

38. Which of the following is NOT part of the first line of defense that helps prevent pathogen invasion:

- a) keratin in the epidermis
- b) mucosal epithelium in the oral cavity
- c) acid in the lumen of the stomach
- d) enterocytes in the small intestine
- e) mucosa-associated lymphoid tissue in the large intestine

39. Which of the following is MOST characteristic of an innate immune response:

- a) takes days to weeks to occur
- b) initiated by macrophages
- c) requires antigen presentation
- d) augmented by a memory component
- e) response is highly specific

40. Removal of B-lymphocytes that recognize self-antigens occurs in the:

- a) lymph nodes
- b) lymphatic nodules
- c) lymphatic vessels
- d) bone marrow
- e) thymus

41 In the thymus, epithelial reticular cells are NOT found:

- a) surrounding capillaries where the blood-thymus barrier is present
- b) surrounding post-capillary venules where T-lymphocytes enter and exit
- c) within Hassall's corpuscles that produce cytokines
- d) along the corticomedullary junction with dendritic cells
- e) in both the cortex and the medulla

42. In lymph nodes, T-cells are MOST prominent in the:

- a) trabeculae
- b) germinal centers
- c) medulla
- d) paracortex
- e) periarterial lymphatic sheaths

43. Which of the following are NOT part of the respiratory portion of the respiratory system:

- a) alveolar sacs
- b) terminal bronchioles
- c) type I pneumocytes
- d) type II pneumocytes
- e) macrophages

44. Which of the following is NOT lined by a pseudostratified columnar epithelium:

- a) nasal cavity
- b) trachea
- c) epiglottis
- d) main (ie. primary) bronchus
- e) lobar (ie. secondary) bronchus

45. Which of the following has ELASTIC cartilage in its submucosa:

- a) nasal cavity
- b) trachea
- c) epiglottis
- d) main (ie. primary) bronchus
- e) lobar (ie. secondary) bronchus

46. Which of the following BEST distinguishes bronchioles from bronchi:

- a) only bronchioles have cilia
- b) only bronchioles have smooth muscle
- c) only bronchi have Clara cells
- d) only bronchi have cartilage
- e) only bronchi are involved in gas exchange

47. In the lung, which of the following is NOT present at the site of gas exchange:

- a) type I pneumocytes
- b) basal lamina glycoproteins secreted by type I pneumocytes
- c) thin layer of loose connective tissue
- d) basal lamina glycoproteins secreted by endothelial cells
- e) endothelial cells

48. In the lip, multinucleated cells are located in the:

- a) epithelium
- b) lamina propria
- c) submucosa
- d) adventitia
- e) serosa

49. In the chronic stages of bacterial invasion of the gingiva (ie. gingivitis), where is the inflammation most evident:

- a) epithelium
- b) lamina propria
- c) submucosa
- d) adventitia
- e) serosa

50. In the adult, which of the following is LEAST regenerative:

- a) dentin of the root of the tooth
- b) dentin of the crown of the tooth
- c) enamel of the crown of the tooth
- d) periodontal ligament
- e) cementum

51. Cementum MOST resembles:

- a) hyaline cartilage
- b) fibrocartilage
- c) tendon
- d) bone
- e) lamina propria of the gingiva

52. Which of the following is NOT present in tongue papillae:

- a) epithelium
- b) lamina propria
- c) tastebuds
- d) collagen
- e) submucosal serous glands

53. Which of the following is NOT present in the submucosa of the esophagus:

- a) smooth muscle
- b) skeletal muscle
- c) autonomic ganglia
- d) connective tissue
- e) serous glands

54. Which of the following are NOT characteristic of enterocytes in the small intestine:

- a) cilia
- b) junctional complexes
- c) glycocalyx
- d) terminal web of actin
- e) mitochondria

55. In the small intestine, where are anti-bacterial Paneth cells located:

- a) in the epithelium of villi
- b) in the loose connective tissue of villi
- c) in the epithelium of crypts
- d) in the loose connective tissue of crypts
- e) in the mucosa-associated lymphoid tissue

56. Which of the following is FALSE:

- a) acinar cells of the pancreas are exocrine in nature
- b) centroacinar cells of the pancreas are exocrine in nature
- c) islet cells of the pancreas are exocrine in nature
- d) hepatocytes are exocrine in nature
- e) hepatocytes are endocrine in nature

57. Which of the following is characteristic of hepatocytes:

- a) prominent smooth endoplasmic reticulum
- b) prominent rough endoplasmic reticulum
- c) prominent cytoplasmic glycogen granules
- d) all of the above
- e) none of above

58. Which of the following are derived from mesoderm:

- a) goblet cells of the small intestine
- b) β cells of the pancreas
- c) Kupffer cells of the liver
- d) all of the above
- e) none of the above

59. Coat proteins such as "COP II" are involved in:

- a) vesicle formation
- b) vesicle movement
- c) vesicle targeting
- d) vesicle tethering
- e) vesicle fusion

60. Which of the following is LEAST affected in yeast that have mutations in the 'Sec-xy' pathway:

- a) the Golgi
- b) the endoplasmic reticulum
- c) the movement of membrane-bound vesicles
- d) vesicular lipid trafficking
- e) non-vesicular lipid trafficking

61. Lipid transfer proteins make lipids soluble in the cytoplasm by:

- a) burying lipids in a hydrophilic pocket
- b) burying lipids in a hydrophobic pocket
- c) binding to lipids in membranes
- d) binding to proteins in membranes
- e) initiating the long-range movement of lipids to distant parts of the cell

62. Which of the following BEST describes the location of podocytes:

- a) visceral layer of Bowman's capsule
- b) parietal layer of Bowman's capsule
- c) urinary space of the renal corpuscle
- d) urinary pole of the renal corpuscle
- e) juxtaglomerular apparatus

63. Which of the following is NOT part of the glomerular (ie. renal) filtration barrier in the kidney:

- a) lamina lucida
- b) lamina densa
- c) lamina propria
- d) endothelial fenestrations
- e) slit membranes

64. Regarding epithelial cells of the proximal tubule of the kidney, which of the following is FALSE:

- a) rest on a basement membrane
- b) have prominent basal microvilli
- c) contain many mitochondria
- d) remove glucose from the lumen of the tubule
- e) release glucose into the peritubular connective tissue space

65. Regarding the action of anti-diuretic hormone (ADH), which of the following is TRUE:

- a) increases glucose movement out of the lumens of the proximal tubules of the kidney
- b) increases protein movement out of the lumens of the loops of Henle of the kidney
- c) increases sodium movement out of the lumens of the distal tubules of the kidney
- d) increases water movement out of the lumens of the collecting tubules of the kidney
- e) increases urine volume

66. In the kidney, which of the following consists of a simple squamous epithelium:

- a) proximal tubules
- b) loops of Henle
- c) distal tubules
- d) collecting tubules
- e) macula densa

67. Regarding the epithelia of the ureters and the bladder, which of the following is FALSE:

- a) there are more cell layers in the epithelium of the bladder than the epithelium of the ureter
- b) the epithelia of the ureters and the bladder are both water impermeable
- c) the epithelia of the ureters and the bladder are both stratified
- d) the epithelial cells of the ureters and the bladder both have dynamic junctions between them
- e) the surface layer of epithelial cells are cuboidal when both the ureters and bladder are fully distended

68. In the epidermis, which of the following has the GREATEST proliferative potential:

- a) stratum basale
- b) stratum spinosum
- c) stratum granulosum
- d) stratum corneum
- e) de-squamated cell ghosts (ie. dead cells that have sloughed off the surface of the skin)

69. In skin, which of the following are NOT derived from ectoderm:

- a) keratinocytes
- b) Langerhans cells
- c) Merkel cells
- d) secretory cells of sebaceous glands
- e) cells lining the ducts of eccrine sweat glands

70. Melanin accumulates in keratinocytes because of:

- a) melanin synthesis within the keratinocytes
- b) phagocytosis of melanin by the keratinocytes
- c) merocrine secretion of melanin by the melanocytes
- d) apocrine secretion of melanin by the melanocytes
- e) holocrine secretion of melanin by the melanocytes

71. Which of the following is TRUE:

- a) the hypodermis is mostly adipose tissue
- b) the reticular layer of the dermis is mostly loose connective tissue
- c) the papillary layer of the dermis is mostly dense connective tissue
- d) the dermis is devoid of capillaries (ie. they are not present)
- e) the dermis is devoid of muscle (ie. there is none present)

72. Which of the following is FALSE:

- a) eccrine sweat glands are tubular
- b) eccrine sweat glands are simple
- c) sebaceous glands are tubular
- d) sebaceous glands are simple
- e) ducts of sebaceous glands are continuous with the canal of the hair follicle

73. Hair follicles form as invaginations of the:

- a) hypodermis
- b) reticular layer of the dermis
- c) papillary layer of the dermis
- d) epidermis
- e) arrector pili

74. Which of the following best describes the process of ATRESIA:

- a) proliferation of oogonia
- b) degeneration of primordial follicles
- c) production of the zona pellucida in primary follicles
- d) formation of spaces between granulosa cells in secondary follicles
- e) rupture of a Graafian follicle during ovulation

75. Which of the following produce the PRECURSOR to estrogen in a Graafian follicle:

- a) theca interna cells
- b) theca externa cells
- c) granulosa cells
- d) primary oocytes
- e) ovarian surface epithelial cells

76. Which of the following is NOT present in the mucosa of the oviduct:

- a) stratified epithelium
- b) columnar cells
- c) secretory cells
- d) cilia
- e) lamina propria

77. Which of the following is NOT present in the mucosa of the uterus:

- a) uterine glands
- b) myometrium
- c) functional layer of endometrium
- d) basal layer of endometrium
- e) helical arteries

78. Regarding the mammary gland, which of the following is FALSE:

- a) epithelial cells are derived from ectoderm
- b) stromal/connective tissue cells are derived from mesoderm
- c) epithelial cells become hyperplastic during pregnancy
- d) stromal/connective cells become hypertrophic during lactation
- e) each mammary gland consists of 15-20 exocrine glands

79. In the mammary gland, which of the following respond to OXYTOCIN:

- a) adipocytes
- b) pericytes
- c) smooth muscle cells
- d) alveolar epithelial cells
- e) myoepithelial cells

80. Which of the following forms part of the blood-testis barrier:

- a) cell junctions between Sertoli cells
- b) cell junctions between spermatogonia
- c) cell junctions between spermatogonia and Sertoli cells
- d) cell junctions between Leydig cells
- e) the junction between seminiferous tubules and the rete testis

81. Which of the following undergo MEIOSIS:

- a) Sertoli cells
- b) spermatogonia
- c) spermatocytes
- d) spermatids
- e) spermatozoa

82. Which of the following are REQUIRED for movement of the tails of spermatozoa:

- a) acrosomal enzymes
- b) actin filaments
- c) microtubules
- d) chromatin
- e) serous secretions of Sertoli cells

83. Which of the following are lined by ciliated epithelial cells:

- a) seminiferous tubules
- b) vas deferens
- c) ejaculatory ducts
- d) rete testes
- e) ductuli efferentes

84. Which of the following pass through the substance of the prostate gland:

- a) seminiferous tubules
- b) vas deferens
- c) ejaculatory ducts
- d) ureters
- e) penile portion of the urethra

85. In the prostate gland, which of the following is located CLOSEST to the lumen:

- a) smooth muscle cells
- b) apical plasma membrane of cuboidal cells
- c) rough endoplasmic reticulum of columnar cells
- d) secretory vesicles containing prostate specific antigen
- e) basement membrane

86. Which of the following CONTRACT in response to sympathetic nervous system stimulation:

- a) contractile cells in the submucosa of the vas deferens
- b) contractile cells in the submucosa of the ductuli efferentes
- c) contractile cells in the submucosa of the rete testis
- d) contractile cells in the submucosa of the large intestine
- e) contractile cells in the submucosa of the small intestine

87. Which of the following is NOT an exocrine secretion:

- a) casein
- b) spermatozoan
- c) oocyte
- d) zymogen
- e) insulin

88. Which of the following is NOT an endocrine secretion:

- a) luteinizing hormone
- b) testosterone
- c) erythropoetin
- d) plasma protein
- e) bile

89. Which of the following is a site of transition from a squamous epithelium to a columnar epithelium:

- a) where the areola merges with the skin
- b) where the trachea branches to form the bronchi
- c) where the vagina becomes the cervix
- d) where the large intestine becomes the small intestine
- e) where the small intestine becomes the stomach

90. Which of the following is NOT a site of transition from a non-keratinizing epithelium to a keratinizing epithelium:

- a) junction of the rectum and the anal canal
- b) junction of the anal canal and the epidermal epithelium
- c) junction of the vaginal epithelium and the epidermal epithelium in the female
- d) junction of the urethral epithelium and the epidermal epithelium in the male
- e) junction of the epithelium of the internal zone of the lip with the epithelium of the external zone of the lip

91. Which of the following contains fixed (ie. not transient) cells that function in the immune system:

- a) epidermis
- b) dermis
- c) lamina propria of the large intestine
- d) all of the above
- e) none of the above

92. Submucosal smooth muscle is prominent in the:

- a) pharynx
- b) oviduct
- c) ejaculatory duct
- d) all of the above
- e) none of the above

93. Continuous capillaries are prominent in the:

- a) anterior pituitary gland
- b) thyroid gland
- c) alveoli of the lung
- d) all of the above
- e) none of the above

94. Which of the following are capable of proliferating:

- a) skeletal myocytes
- b) keratinocytes
- c) parasympathetic neurons
- d) all of the above
- e) none of the above

95. Which of the following are multinucleate:

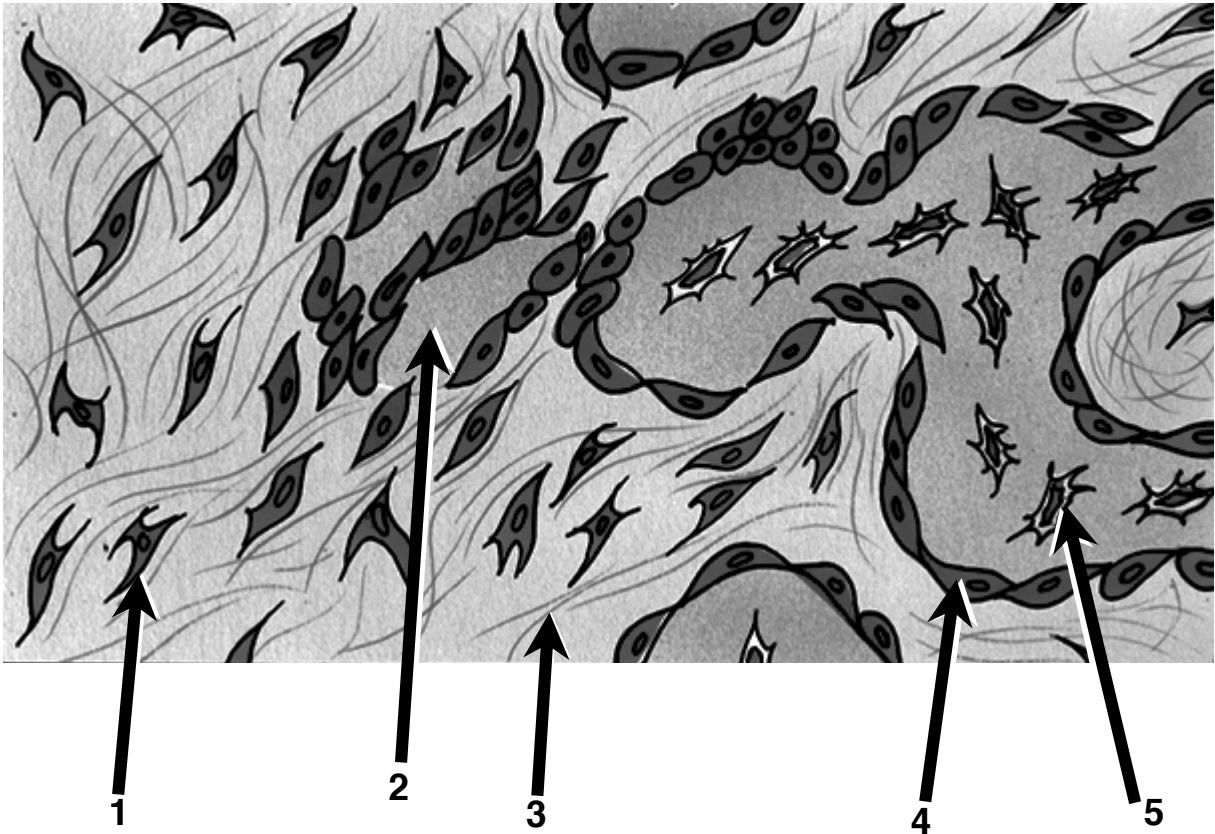
- a) megakaryocytes
- b) cardiomyocytes
- c) contractile cells in the myometrium
- d) all of the above
- e) none of the above

96. Which of the following contain actin:

- a) microvilli
- b) platelets
- c) myoepithelial cells
- d) all of the above
- e) none of the above

End of Multiple Choice Questions - Please Proceed to Short Answer Questions

Fig 1: Intramembranous Bone Formation



97. Which numbered cell represents the undifferentiated mesenchymal stem cell in Fig 1:
(write the cell #) _____

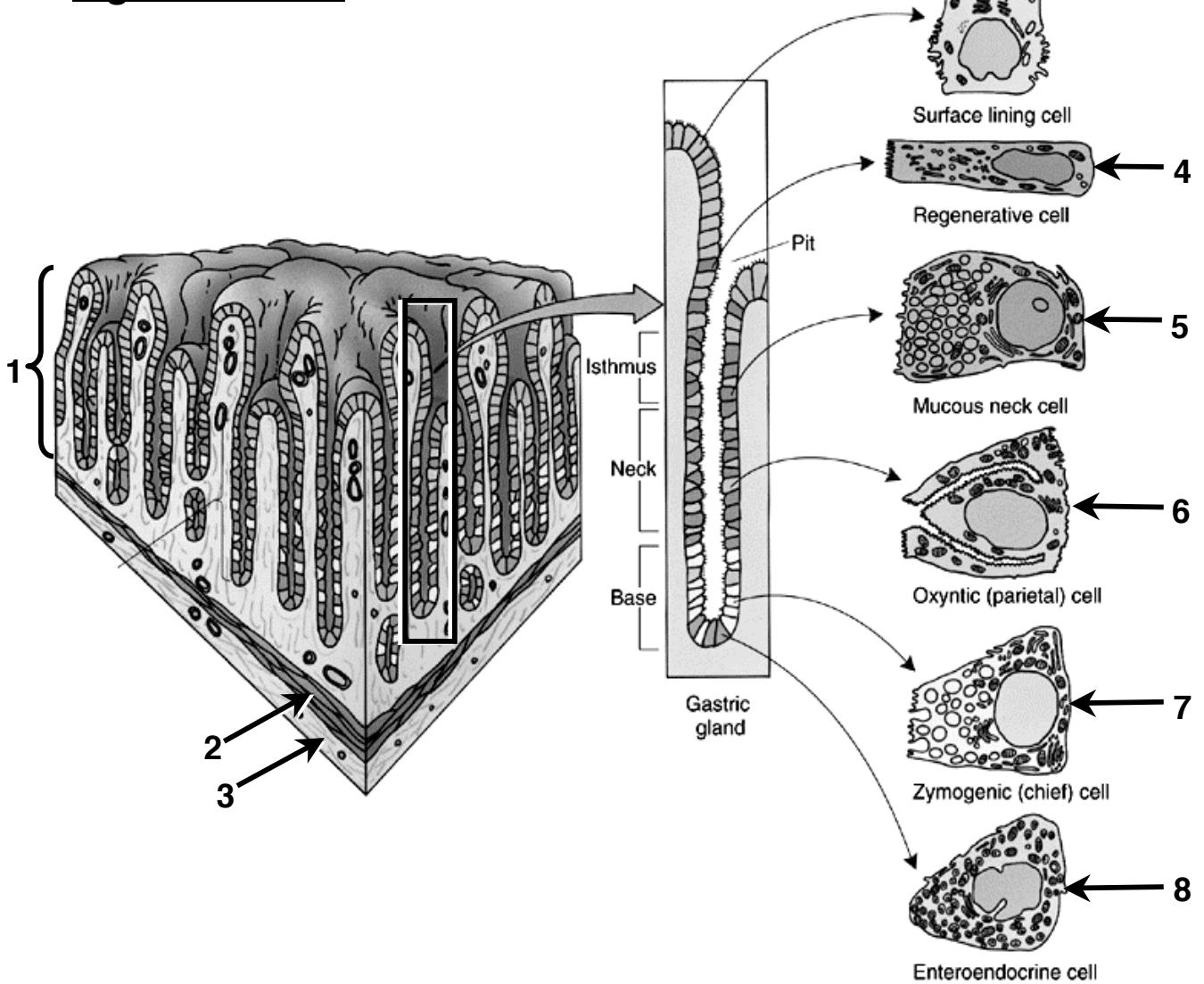
98. What is the name of the cell #4 in Fig 1:
(write the name of the cell) _____

99. What is the name of the matrix at the tip of arrow #2
(name the matrix) _____

100. What is the name of the small processes emanating from Cell #5 in Fig 1:
(name the processes) _____

101. What is the embryonic origin of all the cell types shown in Fig 1.
(write the primary germ layer) _____

Fig 2: Stomach



102. In Fig 2, which numbered structure contains the lamina propria:
 (write the number:) _____

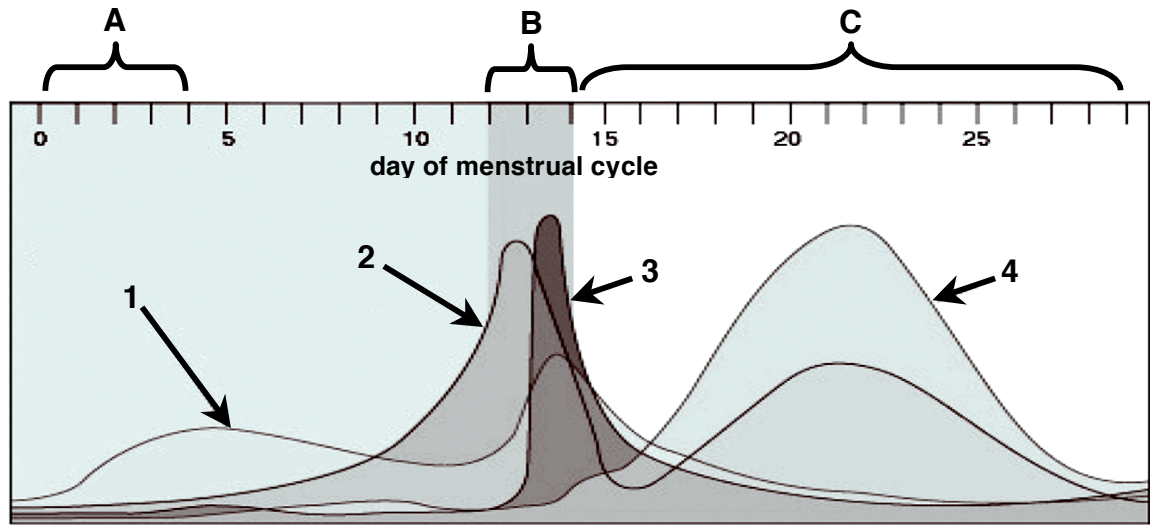
103. In Fig 2, what is the predominant tissue type in structure #2 (please be specific):
 (name the specific tissue type) _____

104. In Fig 2, which numbered cell most acts to decrease the pH of the lumen of the stomach:
 (write the number) _____

105. In Fig 2, which numbered cell secretes a product that relaxes the pyloric sphincter:
 (write the number) _____

106. In Fig 2, which numbered cell contains protease-filled vesicles that bind to apically-located T-snares:
 (write the number) _____

Fig 3: Menstrual Cycle



107. In Fig 3, which numbered hormone represents FSH:
 (write the number) _____

108. Which numbered hormone in Fig 3 most acts to increase uterine gland secretions:
 (write the number) _____

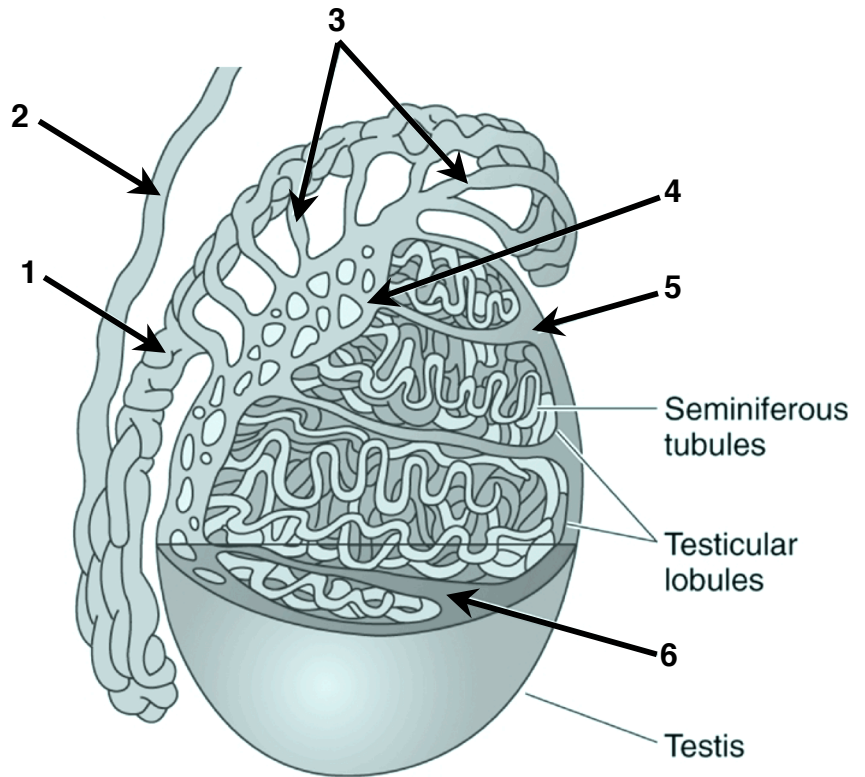
109. Which cell type in the ovary produces hormone #2 in Fig 3 at Day 12 of the menstrual cycle:
 (name the cell type) _____

110. In Fig 3, which bracket (ie. 'A', 'B' or 'C') represents the period when the functional layer of the uterine endometrium is shed:
 (write the letter) _____

111. What major ovarian event occurs within the bracketed time period labelled 'B' in Fig 3:
 (name the event) _____

End of Questions Related to Fig 3

Fig 4: Testis & Ducts



112. Name structure #1 in Fig 4:

(name the structure) _____

113. In Fig 4, which numbered structure is involved in the passive movement of spermatozoa:

(write the number) _____

114. In Fig 4, what specializations are prominent on the apical surface of the columnar epithelial cells that line the lumen of structure #3 :

(name the specializations) _____

115. How many layers of smooth muscle are present in the submucosa of structure #2 in Fig 4:

(write the number) _____

116. What type of tissue predominates in structures #5 and #6 in Fig 4 (please be specific):

(name the specific tissue type) _____

End of Questions Related to Fig 4

Please Proceed To Last Four Questions On Next Page

117. Due to his excellent knowledge of cell biology and histology, a mythical ANAT390 student worked for a summer in a research laboratory attempting to isolate esophageal 'stem cells'. **Which layer of esophageal epithelial cells did he attempt to isolate?**

118. Due to her excellent knowledge of exercise physiology and histology, a mythical ANAT390 student worked for a summer in a research laboratory quantifying differences in the number of extracellular matrix fibers present in biopsies of ruptured achilles tendons: **Which type of ECM fibers, specifically, was she counting?**

119. A mythical ANAT390 teaching assistant ate a bad tunafish sandwich while he was helping prepare the final exam. One hour later an extreme irritation of his gastric mucosa caused a spasm of reverse peristalsis that caused a rush to the bathroom. **Which layer of the stomach wall contained the cells responsible for the reversed peristalsis that caused the vomiting?**

120. A very mythical ANAT390 instructor decided to relax the evening after the final exam. As a result, he drank approximately 710 milliliters of a bubbly liquid that caused him to produce a significant volume of dilute urine. **Which product of his adrenal glands helped reverse this condition?**

End of ANAT390 Exam

Good luck with your remaining exams and have a Happy Holiday Season!