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DEPARTMENT: PRECLINICAL SCIENCES

DISCIPLINE: HISTOLOGY AND EMBRYOLOGY

Courses responsible teacher: Lecturer Iuliana CAZIMIR, DVM, PhD

TOPICS AND REFERENCES

1. **The Cell:** Chapter 2 (pg. 11, 12, 17, 20, 21, 24-32) – **14 pg**. (together with one table and 14 figures);

2. Connective Tissue: Chapter 5 (pg. 72, 73, 76, 78, 83, 87, 91, 95) – **8 pg**. (together with 8 figures);

3. Blood and Hemopoiesis: Chapter 7 (pg. 130, 132, 135, 140, 142, 144, 147, 150) – **8 pg**. (together with one table and 4 figures);

4. Respiratory System: Chapter 11 (pg. 224, 225, 230, 231, 234-240, 243) - **12 pg**. (together with one table and 11 figures);

5. Immune System: Chapter 12 (pg. 250, 251, 254, 256-259, 264, 265, 268, 270) – **11 pg**. (together with one table and 8 figures);

6. Digestive System I and II: Chapters 14 and 15 (pg. 303-306, 308-310, 312, 314, 315, 320-326, 329, 333-342, 346, 349, 352, 353, 355, 358, 361, 364-366) - **38 pg**. (together with two tables and 39 figures);

7. Urinary system: Chapter 16 (pg. 371-376, 387, 395, 396) - **9 pg**. (together with 7 figures);

In total: **100 pages** (which includes 6 tables and 91 figures, representing the equivalent of about 53 text's pages).

REFERENCES

Samuelson, A.D. (2007) ***Textbook of Veterinary Histology***. W.B. Saunders Company and imprint of Elsevier Inc. ISBN-13: 978-0-7216-8174-0.

QUESTIONNAIRE

150 questions with five appropriate possible answers
(Single select multiple-choice questions)

1. From the lumen outward, the four tunics that form the wall of the alimentary canal are arranged in the following correct order:
a. tunica adventitia, tunica submucosa, tunica mucosa, tunica muscularis;
b. tunica mucosa, tunica submucosa, tunica muscularis, tunica adventitia (or serosa);
c. tunica submucosa, tunica muscularis, tunica adventitia, tunica mucosa;
d. tunica mucosa, tunica muscularis, tunica submucosa, tunica adventitia (or serosa);
e. tunica muscularis, tunica mucosa, tunica adventitia, tunica submucosa.

2. The tunica mucosa is composed by:
a. lamina muscularis;
b. tunica muscularis;
c. epithelium, lamina propria, lamina muscularis;
d. epithelium;
e. lamina propria.

3. The lamina muscularis consists in a small layer of:
a. collagen fibers;
b. reticular fibers;
c. smooth muscle fibers;
d. skeletal muscle fibers;
e. elastic fibers.

4. The submucosal plexi is placed:
a. in tunica submucosa;
b. in lamina muscularis;
c. in tunica mucosa;
d. in tunica muscularis;
e. between tunica muscularis and tunica adventitia.

5. The myenteric plexus is located:
a. in tunica adventitia;
b. in tunica submucosa;
c. between the layers of the tunica muscularis;
d. in tunica mucosa;
e. between tunica mucosa and tunica muscularis.

6. From the external surface to the internal surface, list the components of the lips in order:
a. tunica mucosa;
b. epidermis and dermis with hair follicles;
c. skeletal muscle, epidermis and dermis;
d. epidermis and dermis, skeletal muscle, tunica submucosa and tunica mucosa;
e. tunica mucosa, epidermis and dermis with hair follicles.

7. What type of epithelium will have the lips' mucosa in herbivorous animals?
a. a stratified squamous epithelium, well keratinized or cornified;
b. a simple columnar epithelium,
c. a bistratified columnar epithelium;
d. a transitional epithelium;
e. a simple pseudostratified columnar epithelium.

8. Which component is missing from the soft palate structure?
a. the non-kerainized stratified squamous epithelium;
b. a core of skeletal muscle;
c. the lamina propria;
d. the submucosa;
e. a lamina muscularis.

9. What type of epithelium is lining the oropharyngeal surface of the soft palate?
a. a transitional epithelium;
b. a non-keratinized stratified squamous epithelium;
c. a bistratified columnar epithelium;
d. a simple columnar epithelium;
e. a pseudostratified columnar epithelium.

10. Rostrally, the nasopharyngeal surface of the soft palate is lining by a:
a. transitional epithelium;
b. non-keratinized stratified squamous epithelium;
c. bistratified columnar epithelium;

d. simple columnar epithelium;
e. pseudostratified columnar epithelium.

11. Among domestic species the epithelium of the tongue's mucosa is dorsally:
a. keratinized stratified squamous;
b. simple columnar;
c. bistratified columnar;
d. transitional;
e. pseudostratified columnar.

12. In the tongue structure, the muscle tissue is represented by:
a. smooth muscle cells;
b. reticular fibers;
c. skeletal muscle fibers;
d. collagen fibers;
e. striated cardiac muscle fibers.

13. In birds, the tongue is lined by a:
a. pseudostratified columnar epithelium;
b. simple columnar epithelium;
c. transitional epithelium;
d. keratinized stratified squamous epithelium;
e. bistratified columnar epithelium.

14. Among different components, the dentin is composed of:
a. calcium hydroxyapatite and collagen;
b. loose connective tissue;
c. blood vessels;
d. nervous tissue;
e. lymphatic tissue.

15. The odontoblastic processes are integrated in:
a. the cementum;
b. the skeletal muscle fiber;
c. the dentin;
d. sarcomere;
e. the smooth muscle cell.

16. The enamel is consisting of:
a. collagen fibers;
b. different cells;
c. nervous fibers;
d. calcium hydroxyapatite arranged in large crystals;
e. muscle fibers.

17. The enamel is located:
a. along the external surface of the tooth;
b. in cementum;
c. in sarcomere;
d. in dentin;
e. along the skeletal muscle fiber.

18. The enamel is produced by:
a. the ameloblasts;
b. the chondrocytes;

c. the odontoblasts;
d. the osteoblasts;
e. the osteocytes.

19. The dentin is produced by:
a. the osteoblasts;
b. the chondrocytes;
c. the odontoblasts;
d. the osteocytes.
e. the ameloblasts;

20. The cementum is produced by:
a. the osteocytes;
b. the cementocytes;
c. the odontoblasts;
d. the ameloblasts;
e. the cementoblasts.

21. The innermost zone of the tooth pulp contains:
a. ameloblasts;
b. osteocytes;
c. skeletal muscle fibers;
d. mesenchymal cells;
e. smooth muscle cells.

22. The material produced by the odontoblasts is:
a. the enamel;
b. the blood;
c. the elastin;
d. the dentin;
e. the cementum.

23. During embryogenesis, the teeth primordia are developed from:
a. the endoderm;
b. the nervous tissue;
c. the connective fibrous tissue;
d. the oral ectoderm and its subjacent mesenchyme;
e. the blood vessels.

24. Each adult tooth is attached to the alveolar bone using:
a. smooth muscle fibers;
b. nervous fibers;
c. the periodontal ligament;
d. reticular fibers;
e. an aponeurosis.

25. The dentin is structured by different components except:
a. the elastic fibers;
b. water;
c. calcium hydroxyapatite;
d. proteoglycans;
e. glycoproteins.

26. The apical foramen represents:

a. the odontoblastic zone;
b. the fibers free zone;
c. a small orifice;
d. the tooth pulp;
e. the external surface of the tooth.

27. During embryogenesis, the enamel organs are developed from:
a. the oral ectoderm;
b. the mesenchymal cells;
c. the odontoblasts;
d. the reticular cells;
e. the oligodendrocytes.

28. The salivary glands are:
a. endocrine glands;
b. mixed glands;
c. holocrine glands;
d. tubulo-alveolar glands;
e. lactiferous glands.

29. The salivary glands are organised in lobules which contain:
a. follicles;
b. cells' cords;
c. cells' islets;
d. skeletal fibers bundles;
e. numerous adenomeres.

30. In the structure of the salivary glands, each adenomere is bounded by:
a. some neuroglia cells;
b. myoepithelial cells;
c. the oligodendrocytes;
d. the elastic fibers;
e. skeletal muscle fibers.

31. Components of the salivary glands, the striated ducts are lined by:
a. mast cells;
b. a simple squamous epithelium;
c. plasma cells;
d. a single layer of epithelial cells;
e. a bistratified epithelium.

32. In the oropharynx, the tunica mucosa consists mostly of:
a. an endothelium;
b. a stratified squamous epithelium;
c. a transitional epithelium;
d. a pseudostratified columnar epithelium;
e. a simple cuboidal epithelium.

33. In the nasopharynx and the laryngopharynx, the tunica mucosa consists of:
a. a bistratified columnar epithelium;
b. an endothelium;
c. a stratified squamous epithelium;
d. a transitional epithelium;
e. a pseudostratified columnar epithelium.

34. The esophageal mucosa in ruminant species possess:
a. a transitional epithelium;
b. an endothelium;
c. a keratinized epithelium;
d. a simple squamous epithelium;
e. a non-keratinized epithelium.

35. The esophageal mucosa in carnivores is:
a. a keratinized epithelium;
b. a non-keratinized epithelium;
c. a simple squamous epithelium;
d. a bistratified epithelium;
e. a transitional epithelium.

36. Histologically, the crop or ingluvies is similar to:
a. the larinx;
b. the proventriculus;
c. the stomach;
d. the gizzard;
e. the esophagus.

37. The stomach's mucosa is lining by:
a. a simple squamous epithelium;
b. a stratified columnar epithelium;
c. a stratified squamous epithelium;
d. a simple columnar epithelium;
e. a bistratified cuboidal epithelium.

38. The stomach's mucosa contains:
a. skeletal fibers bundles;
b. mixed acini;
c. serous acini;
d. cardiac, proper and pyloric gastric glands;
e. sebaceous glands.

39. Integrated in the proper gastric glands, the parietal cells produce:
a. calcitonin;
b.epinephrine;
c. hydrochloric acid;
d. insulin;
e. renin and angiotensin I.

40. Histostructurally, the proper gastric glands are:
a. acinous;
b. tubular and branched;
c. folicular;
d. tubulo-alveolar, coiled;
e. tubulo-alveolar.

41. In the stomach's wall, the tunica muscularis has:
a. red fibers;
b. cardiac striated fibers;
c. skeletal striated fibers;

d. smooth muscle fibers;
e. white fibers.

42. The ruminant stomach's mucosa is lining by:
a. a simple squamous epithelium;
b. a stratified columnar epithelium;
c. a non-keratinized stratified squamous epithelium;
d. a simple columnar epithelium;
e. a keratinized stratified squamous epithelium.

43. In the ruminant stomach's mucosa, at the level of the reticular crests' structure are integrated:
a. tubular glands;
b. serous acini;
c. smooth muscle cells;
d. striated muscle cells;
e. mucous acini.

44. Commonly, the axis of the rumen papillae don't have:
a. a lamina muscularis;
b. collagen fibers;
c. connective tissue;
d. connective cells;
e. fibroblasts.

45. The omasum laminae contain:
a. skeletal muscle fibers;
b. internal extensions of the tunica muscularis;
c. a cluster of cardiac muscle cells;
d. striated muscle cells;
e. mucous acini.

46. The proper gastric glands contain the following cell types, with the exception of:
a. the parietal cells;
b. the chief cells;
c. the serous cells;
d. the enteroendocrine cells;
e. the mucous neck cells.

47. In birds, into the ventriculus or gizzard are integrated:
a. red fibers;
b. cardiac striated fibers;
c. smooth muscle fibers;
d. skeletal striated fibers;
e. white fibers.

48. The small intestine villi are lined by:
a. a pseudostratified epithelium;
b. enterocytes;
c. cuboidal cells;
d. squamous cells;
e. ciliated cells.

49. The presence of the intestine villi is noticed in:
a. duodenum;

b. ileum;
c. jejunum;
d. cecum;
e. the structures from a, b and c.

50. The intestine villi are missing in:
a. the teniae coli;
b. ileum;
c. rectum;
d. the teniae ceci;
e. the structures from a, c and d.

51. In the intestinal crypts are missing:
a. the enterocyte;
b. the goblet cells;
c. the endothelial cells;
d. the Paneth cells;
e. the enteroendocrine cells.

52. One of these references about the Paneth cells is not correct:
a. they are hormones producing cells;
b. they are not found in all mammals;
c. they are typically pyramidal;
d. their cytoplasm is filled with acidophilic granules;
e. they have antimicrobial capabilities.

53. The submucosal glands of the small intestine are:
a. represent by acini;
b. mucous in porcine;
c. branched tubulo-alveolar;
d. serous in dogs;
e. the most prominent within the cecum region.

54. In the large intestine, the simple tubular glands:
a. contain chief cells;
b. contain numerous mucus secreting cells;
c. are lack in mucus secreting cells;
d. contain ciliated cells;
e. integrate striated muscle cells.

55. The intermediate zone of the anal canal presents:
a. a simple squamous epithelium;
b. an endothelium;
c. a non-keratinized stratified squamous epithelium;
d. a transitional epithelium;
e. a ciliated epithelium.

56. In the salivary glands' structure, the intercalated duct is lined by:
a. a simple cuboidal epithelium;
b. a bistratified cuboidal epithelium;
c. a bistratified columnar epithelium;
d. a simple columnar epithelium with striated border;
e. a simple columnar epithelium with brush border.

57. In the salivary glands' structure are integrated the following cells, with the exception of:
a. the serous cells;
b. the mucous cells;
c. the chondrocytes;
d. the mucus producing cells;
e. the enzyme producing cells.

58. Within the liver of domestic animals, each hepatic lobule contains:
a. hepatocyte;
b. hepatic sinusoids;
c. serous acini;
d. bile canaliculi;
e. the structures from a, b and d.

59. Within the hepatic acinus structure, it can be observed:
a. three zone of vascular influence;
b. serous acini;
c. mucous acini;
d. mixed acini;
e. the structures from b, c and d.

60. The liver parenchyma is geometrically organized in repetitive structures, which have:
a. a spherical view;
b. a cylindrical view;
c. a polygonal view;
d. a circular view;
e. a stellate view.

61. In the liver structure, the bile duct, portal vein, and hepatic artery collectively form:
a. the portal lobule;
b. the portal acinus;
c. the portal triad;
d. the classical lobule
e. the hepatic sinusoids.

62. In the portal lobule, the focal point is directed to:
a. a sinusoid;
b. a bile duct;
c. a central vein;
d. an endothelium;
e. a row of hepatocytes.

63. The focal points for the hepatic acinus are:
a. two adjacent central veins and nearby portal triads;
b. two bile ducts;
c. two adjacent rows of hepatocytes;
d. two different central veins;
e. the portal vein and hepatic artery.

64. The sinusoids are covered by:
a. a continuous endothelium;
b. a porous and fenestrated endothelium;
c. a cuboidal epithelium;
d. a fenestrated endothelium with a brush border;

e. a fenestrated endothelium with a striated border.

65. The sinusoidal lining cells are separated from the hepatocytes by:
a. the portal vein;
b. the hepatic artery;
c. the bile canaliculi;
d. the portal triad;
e. a perisinusoidal space.

66. Considering an exception, the sinusoids have a continuous basal laminae in the liver parenchyma in:
a. pigs;
b. dogs;
c. ruminants;
d. birds;
e. horses.

67. The hepatocytes are lining by a plasmalemma which form:
a. cilia;
b. pseudopodia;
c. microvilli;
d. lamellipodia;
e. villi.

68. The hepatic sinusoids are:
a. ducts;
b. channels;
c. veins;
d. capillaries;
e. spaces.

69. The sinusoidal capillaries connect:
a. two intralobular bile canaliculi;
b. the interlobular arteries and the bile ductules;
c. the central vein and the intralobular bile canaliculi;
d. the central vein and the interlobular biliary ducts;
e. the interlobular vessels to the central vein.

70. The bile canaliculi are formed by:
a. the endothelial cells;
b. the adjacent hepatocytes plasmalemma;
c. the adipocytes;
d. the serous cells;
e. the macrophages.

71. The bile canaliculi conduct bile from hepatocytes to:
a. sinusoids;
b. the perisinusoidal space;
c. the bile ductules;
d. the central vein;
e. the monocyte-macrophage system.

72. The interlobular biliary ducts are lined by:
a. a simple columnar or cuboidal epithelium;

b. a simple squamous epithelium,
c. a ciliated epithelium;
d. a bistratified columnar epithelium;
e. an endothelium.

73. The exocrine pancreas contains secretory cells, very similar with:
a. the liver cells;
b. the spleen cells;
c. the kidney cells;
d. the salivary glands cells;
e. the lung cells.

74. The structure of the larynx cartilages is:
a. fibrous;
b. serous;
c. hyaline and elastic;
d. striated;
e. smooth.

75. The larynx muscles are formed by:
a. elastic fibers;
b. striated cardiac fibers;
c. smooth fibers;
d. skeletal fibers;
e. reticular fibers.

76. The trachealis muscle contains:
a. striated skeletal muscle fibers;
b. white muscle fibers;
c. smooth muscle fibers;
d. red muscle fibers;
e. striated cardiac muscle fibers.

77. The intrapulmonary bronchi contain the following structures, with the exception of:
a. the ciliated epithelium;
b. the smooth muscle fibers;
c. the collagen fibers;
d. the skeletal muscle fibers;
e. the hyaline cartilage.

78. In the structure of the bronchioles is missing:
a. the epithelium;
b. the smooth muscle fibers;
c. the collagen fibers;
d. bronchiolar exocrine cells;
e. the hyaline cartilage.

79. In mammals, the respiratory portion of the lung is composed by:
a. the alveoli;
b. the alveolar sacs;
c. the terminal bronchioles;
d. the structures from a, b and e;
e. the alveolar ducts.

80. At the level of the respiratory system, the fixed alveolar cells are:
a. type I pneumocyte;
b. type II pneumocyte;
c. the septal macrophages;
d. the structures from a and b;
e. the structures from a, b and c.

81. At the level of the respiratory system, the moving alveolar cells are represented by:
a. the type I pneumocyte;
b. the type II pneumocyte;
c. the septal macrophages;
d. the structures from a and b;
e. the structures from a, b and c.

82. At the level of the respiratory system, the alveoli are lining by:
a. a squamous epithelium;
b. a ciliated epithelium;
c. a columnar epithelium;
d. a cuboidal epithelium;
e. a bistratified epithelium.

83. In the nephron's structure, the renal corpuscle contains:
a. the glomerular capsule;
b. the proximal convoluted tubule;
c. the glomerulus;
d. the thin tubule;
e. the structures from a and c.

84. In the glomerular capsule structure, the cells of the visceral layer are represented by:
a. the mesangial cells;
b. the podocytes;
c. the endothelial cells;
d. the cuboidal cells;
e. the fibroblasts.

85. In the kidney parenchyma, the juxtaglomerular apparatus contains:
a. the podocytes;
b. the juxtaglomerular cells;
c. the macula densa;
d. the structures from a and b.
e. the structures from b and c.

86. The mucosal lining of the calyces and pelvis consist of:
a. a simple squamous epithelium;
b. a non-cornified stratified squamous epithelium;
c. a pseudostratified columnar epithelium;
d. a transitional epithelium;
e. a bistratified columnar epithelium.

87. The tunica muscularis of the urinary bladder is:
a. more oblique and interwoven and lacks specific circular layers;
b. a single layer of smooth muscle cells;
c. two layers of smooth muscle cells;
d. a single layer of skeletal muscle cells;

e. three layers of skeletal muscle cells.

88. The main component of the lymphoid organs, the lymphoid tissue is formed by:
a. reticular cells and fibers;
b. immunocompetent cells;
c. serous cells;
d. a and b;
e. glial cells.

89. The primary lymphoid organs are represented by:
a. thymus and lymph node;
b. bone marrow and the thymus;
c. thymus and the spleen;
d. lymph node and the spleen;
e. the structures from c and d.

90. The secondary lymphoid organs are represented by:
a. thymus and lymph node;
b. bone marrow and the thymus;
c. thymus and the spleen;
d. lymph node and the spleen;
e. the structures from b and d.

91. The main cells involve in immunity are the following, with the exception of:
a. lymphocytes T and B;
b. plasma cells;
c. antigen-presenting cells;
d. macrophages;
e. chondrocytes.

92. In the thymus cortex, the main important cells are:
a. the thymocytes and the epithelial reticular cells;
b. the thymocytes and the lymphocytes T;
c. the thymocytes and the plasma cells;
d. the lymphocytes T and the plasma cells;
e. the thymocytes and the chondrocytes.

93. The thymic corpuscles contain:
a. fibroblasts;
b. epithelial reticular cells;
c. epithelial cuboidal cells;
d. chondroblasts;
e. adipocytes.

94. In birds, the cloacal bursa possesses a lymphoepithelial parenchyma comparable with that of:
a. the spleen;
b. the thymus;
c. the liver;
d. the lung;
e. the salivary glands.

95. The structure of the lymph nodules consist of concentrated areas of:
a. macrophages;
b. fibroblasts;

c. lymphocytes;
d. chondrocytes;
e. mast cells.

96. In the lymph nodes structure, the paracortex is placed:
a. between the capsule and the cortex;
b. at a hilum;
c. along the periphery;
d. in medulla;
e. between the cortex and the medulla.

97. The red pulp of the spleen's parenchyma is constructed by:
a. connective tissue's trabeculae;
b. the structures from c and e;
c. venous sinusoids;
d. smooth muscle cells;
e. splenic cords.

98. The white pulp of the spleen's parenchyma is constructed by:
a. sheaths of lymphocytes surrounding arteries;
b. the structures from a and c;
c. lymphoid nodules;
d. venous sinusoids;
e. splenic cords.

99. The splenic cords are integrated in:
a. the white pulp;
b. the red pulp;
c. the trabeculae;
d. the lymphoid nodules;
e. the capsule.

100. The lymphatic structures associated with the tunica mucosa are represented by:
a. the oral cavity and pharynx tonsils;
b. the structures from a,c and e;
c. the Peyer's patches;
d. the muscle tissues;
e. the cecal tonsils.

101. The goblet cells integrated in the intestine epithelium are:
a. contractile cells;
b. hormone-producing cells;
c. mucus-producing cells;
d. enzyme-producing cells;
e. serous cells.

102. In the intestinal mucosa, the lamina muscularis consists of:
a. a single layer of smooth muscle cells;
b. two layers of skeletal muscle cells;
c. three layers of skeletal muscle cells;
d. two layers of smooth muscle cells;
e. a single layer of skeletal muscle cells.

103. The omasum epithelium is:

a. a keratinized stratified squamous epithelium;
b. a ciliated epithelium;
c. a columnar epithelium;
d. a non-keratinized stratified squamous epithelium;
e. a bistratified cuboidal epithelium.

104. The trachea's epithelium contains the following cells, with the exception of:
a. ciliated columnar cells;
b. Clara cells;
c. parietal cells;
d. goblet cells;
e. neuroendocrine cells.

105. The epithelium at the level of the digestive tract is covered by:
a. a calcium hydroxyapatite layer;
b. the dentin;
c. a mucus-rich substance;
d. the elastic fibers;
e. epinephrine.

106. Each nephron has a glomerular basement membrane consists of:
a. three layers or laminae;
b. a simple cuboidal epithelium with brush border;
c. a simple squamous epithelium;
d. a simple cuboidal epithelium with cilia;
e. bistratified columnar epithelium.

107. In the digestive tract the mucosal glands:
a. contain serous acini;
b. may be housed in the lamina propria;
c. consist of connective tissue;
d. are lactiferous glands;
e. are lined by a transitional epithelium.

108. The abomasum epithelium is:
a. a squamous epithelium;
b. a ciliated epithelium;
c. a columnar epithelium;
d. a cuboidal epithelium;
e. a bistratified epithelium.

109. In the splenic structure, the venous sinusoids or sinuses are lined by:
a. a simple cuboidal epithelium with cilia;
b. an usually shaped endothelium;
c. elastic fibers;
d. podocytes;
e. serous cells.

110. The outer covering structure of the alimentary canal is:
a. lamina propria;
b. lamina muscularis;
c. tunica submucosa;
d. tunica adventitia;
e. tunica mucosa.

111. What statement about the endoplasmic reticulum is true?
a. it has the marker enzymes represented by acidic hydrolases;
b. it is closely associated with the nuclear envelope;
c. it transports molecules from the intracellular space towards extracellular space;
d. it produces starch;
e. it contains glyoxysomes.

112. Which cell of the connective tissue secretes heparin and histamine?
a. mast cell;
b. plasma cell;
c. fibrocyte;
d. pigment-producing cell;
e. fibroblast.

113. Which organelle holds a variety of lytic enzymes?
a. Golgi complex;
b. mitochondria;
c. lysosome;
d. rough endoplasmic reticulum;
e. ribosome.

114. What are the structures which contribute to the cell's cytoskeleton?
a. ribosomes;
b. collagen and elastic fibers;
c. filaments and microtubules;
d. connective fibers;
e. reticular and collagen fibers.

115. Which organelle is involved in detoxification and lipid complexing from fatty acids?
a. ribosomes;
b. smooth endoplasmic reticulum;
c. lysosome;
d. mitochondria;
e. proteasome.

116. What are the folds on the inner mitochondrial membrane called?
a. pseudopodia;
b. cristae;
c. glycocalyx;
d. tubules;
e. plicae.

117. Which of the following terms refers to cell death?
a. apoptosis;
b. cytokinesis;
c. resting stage;
d. pluripotency;
e. none of the aforementioned terms refers to cell death.

118. In the cytosol both ribosomal subunits become associated with:
a. microtubules;
b. lysosomes;
c. a strand of mRNA;

d. actin filaments;
e. reticular fibers.

119. Which of the following cell's component is an organelle?
a. pigment;
b. mitochondria;
c. glycogen;
d. myosin;
e. vesicle.

120. The plasmalemma's proteins which permit the movement of ions and small molecules are:
a. carrier proteins;
b. structural proteins;
c. receptor proteins;
d. channel proteins;
e. enzymes.

121. Which is the limiting membrane of each cell?
a. basal lamina;
b. plasmalemma;
c. cristae;
d. *Lamina rara*;
e. glycocalyx.

122. Which cells can have more than one nucleus?
a. goblet cells;
b. osteoclasts;
c. adipocytes;
d. neutrophils;
e. lymphocytes.

123. During the cell's cycle the nucleolus will be visible in:
a. later prophase;
b. prometaphase;
c. anaphase;
d. interphase;
e. metaphase.

124. The lipids of the plasma membrane are represented by:
a. simple lipids;
b. phospholipids;
c. sitosterols;
d. triglycerides;
e. polyunsaturated fatty acids.

125. Which of the following is not a fibre found in the connective tissue?
a. elastic fibre;
b. collagen type-I fibre;
c. Purkinje fibre;
d. collagen type-IX fibre;
e. reticular fibre.

126. Which cell produces the extracellular matrix of the connective tissue?
a. plasma cell;

b. myofibroblast;
c. lymphocyte;
d. fibroblast;
e. fibrocyte.

127. Which of the following is not a membranous organelle?
a. lysosome;
b. peroxisome;
c. Golgi complex;
d. microtubule;
e. mitochondria.

128. The rough endoplasmic reticulum extends from:
a. the inner layer of the plasmalemma;
b. the cytoskeleton;
c. the outer membrane of the nuclear envelope;
d. the Golgi complex sacs;
e. the outer membrane of the mitochondria.

129. Chains of ribosomes unassociated with the endoplasmic reticulum are called:
a. proteasomes;
b. polysomes;
c. cristae;
d. glyoxysomes;
e. peroxisomes.

130. The cis-face of the Golgi complex is directly connected to:
a. plasmalemma;
b. cristae;
c. lysosome;
d. endoplasmic reticulum;
e. nuclear envelope.

131. Which are the most abundant fibers in dense connective tissue?
a. reticular fibers;
b. muscle fibers;
c. collagen fibers;
d. elastic fibers;
e. nerve fibers.

132. Which cell is a phagocyte?
a. neutrophil;
b. keratinocyte;
c. fibroblast;
d. melanocyte;
e. erythrocyte.

133. Which of the following structure does not contain connective tissue?
a. ligament;
b. tendon;
c. mitochondria;
d. cartilage;
e. bone.

134. Which of the following structures stain in purple having affinity for basic dyes?
a. cytoplasm;
b. collagen fibers;
c. elastic fibers;
d. reticular fibers;
e. nucleus.

135. Contents of the eukaryotic cells are referred to as:
a. nucleoplasm;
b. extracellular matrix;
c. protoplasm;
d. cytoplasm;
e. ground substance.

136. The nucleolus is composed mostly of:
a. deoxyribonucleic acid;
b. collagen;
c. proteins and ribonucleic acid;
d. lytic enzymes;
e. carbohydrates.

137. The ribosomal subunits are constructed in:
a. Golgi complex;
b. mitochondria;
c. cytoplasm;
d. cytoskeleton;
e. nucleolus.

138. The inner membrane of the nuclear envelope is lined by:
a. ground substance;
b. basal lamina;
c. nuclear lamina;
d. plasmalemma;
e. glycocalyx.

139. The cytoplasmatic area disposed adjacent to the cell's plasmalemma called:
a. protoplasm;
b. ectoplasm;
c. endoplasm;
d. nucleoplasm;
e. sarcoplasm.

140. In the cell's cytoplasm, the secretory vesicles are formed by:
a. Golgi complex;
b. mitochondria;
c. lysosome;
d. rough endoplasmic reticulum;
e. ribosomes.

141. The lysosomes are extremely abundant in:
a. fibroblasts;
b. phagocytic cells;
c. muscle cells;
d. plasma cells;

e. anucleate cells.

142. From the cellular ingestion of fluid matter by endocytosis results:
a. some pigment;
b. a phagosome;
c. a pinosome;
d. glycogen;
e. an autophagosome.

143. The immature erythrocyte seen in the peripheral blood is called:
a. eosinophil;
b. reticulocyte;
c. plasmocyte;
d. megakaryocyte;
e. progenitor cell.

144. The female animals present the Barr body often visible attached on the nucleus in:
a. erythrocytes;
b. macrophages;
c. adipocytes;
d. neutrophils;
e. lymphocytes.

145. The azurophilic granules of the neutrophils are:
a. ribosomes;
b. primary lysosomes;
c. endosomes;
d. autophagosomes;
e. proteasomes.

146. The eosinophils are involved:
a. to defend against microbial infection;
b. to play a role in inflammatory activities;
c. in combating parasite infestation;
d. in immunological defence for the body;
e. in the immunoglobulin's secretion.

147. Phagocytosis by basophils is:
a. very active;
b. similar to neutrophils;
c. Associated with mucus secretion;
d. very limited;
e. concomitant with exocytosis.

148. Platelets are derived from:
a. mast cell;
b. megakaryocyte;
c. fibroblast
d. lymphocyte;
e. chondrocyte.

149. Dense regular connective tissue is the main component of the:
a. dermis;
b. perimysium;

c. tendons;
d. bone;
e. hyaline cartilage.

150. The brown coloration for the multilocular adipose tissue is due to numerous:
a. mitochondria;
b. ribosomes
c. vesicles;
d. lysosomes;
e. proteasomes.

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