Failure to Thrive Practice Questions

PART I: DIRECTIONS. Each of the numbered items or incomplete statements in this section is followed by answers or by completions of the statement. Select the ONE lettered answer or completion that is BEST in each case.

1. The GI tract is characterized in several locations by sudden, abrupt changes in the surface epithelium as you move from region to region. While examining a slide, you observe a simple columnar epithelium in which all the surface cells appear to be identical. That epithelium suddenly changes into a simple columnar epithelium with goblet cells and absorptive cells. You are at the junction between:
   A. Duodenum and jejunum
   B. Esophagus and stomach
   C. Ileum and colon
   D. Rectum and anal canal
   E. Stomach and duodenum

2. In a liver acinus:
   A. An exogenous toxin would first cause hepatocyte death in zone I
   B. High blood glucose levels would first lead to glycogen deposition in zone III
   C. Hypoxia would first cause the degeneration of cells in zone I
   D. All the above
   E. Choices A & C only

3. A mesothelium:
   A. Is a part of an adventitia but not of a serosa
   B. Is a part of the structure of a mesentery
   C. Is found in the abdominal cavity, but not in the pleural cavity
   D. Is the innermost layer of the GI tube, i.e., the layer that lines the lumen
   E. Is the outermost covering of the trachea

4. The normal gall bladder:
   A. Concentrates bile by actively transporting sodium ions from its lamina propria into its lumen
   B. Contracts only in response to stimulation by the parasympathetic nervous system
C. Expels bile into the cystic duct when the skeletal muscle in its muscularis contracts
D. Has an outer surface that is covered in part by an adventitia and in part by a serosa
E. Is lined by a pseudostratified columnar epithelium containing absorptive cells and goblet cells

5. Some people feel that the proper way to eat an Oreo is to separate the two cookies, lick off the creamy filling, and then eat the cookies. What feature of the tongue provides the abrasive quality that allows you to efficiently lick off the filling?
   A. Filiform papillae
   B. Foliate papillae
   C. Lingual tonsils
   D. Sulcus terminalis
   E. Vallate papillae

6. The appendix is a common site of origin for a tumor that can result in a condition known as carcinoid syndrome. Symptoms include diarrhea due to excess serotonin secretion by the tumor cells. Neoplastic transformation of which of the following cell types of the normal appendix is most likely to be responsible for this excess serotonin secretion:
   A. Chief cells
   B. DNES cells
   C. Enterocytes
   D. Eosinophils
   E. M cells
   F. Paneth cells

7. The presence &/or abundance of goblet cells can be a valuable indicator of pathology. In biopsy sections of normal tissue, goblet cells:
   A. Would be absent in the olfactory epithelium
   B. Would be abundant in the luminal epithelium of terminal bronchioles
   C. Would be present in taste buds
   D. Would be present on intestinal villi, but not in intestinal glands (crypts of Lieberkühn)
   E. All the above

8. In a biopsy section of human liver, you observe all the features listed below. Which feature is abnormal and would indicate liver pathology:
A. Branches of the bile duct are located near branches of the portal vein and hepatic artery
B. Connective tissue septa interconnect neighboring portal canals
C. Plates of hepatocytes are radially arranged around central veins
D. Small amounts of lipofuscin are present and are localized near bile canaliculi in the cytoplasm of the hepatocytes
E. Some of the hepatocytes are binucleate

9. The parotid glands:
   A. Are a common site for the replication of the mumps virus
   B. Are traversed by branches of the facial nerve, which may be injured during surgery for parotid tumors
   C. Contain striated ducts that actively transport Na+ out of the duct lumen
   D. Tend to accumulate increasing numbers of white adipocytes with increasing age
   E. Transport IgA into the saliva
   F. All the above

10. Hepatocytes have important endocrine functions, including the synthesis and secretion of albumen. Which of the following pathways is the one followed by albumen after its release from an hepatocyte:
    A. Bile canaliculus → bile ductule → portal canal
    B. Bile canaliculus → space of Disse → portal canal
    C. Space of Disse → sinusoid → central vein
    D. Space of Disse → sinusoid → distributing vessel

11. The major function of M cells is to:
    A. Phagocytize and destroy antigens found in the lumen of the gut
    B. Secrete antimicrobial proteins such as defensins into the lumen of the GI tract
    C. Synthesize IgA and secrete it into the gut lumen
    D. Transport antigens across the intestinal epithelium from the gut lumen
    E. Transport lymphocytes from the wall of the intestine into the gut lumen

12. A biopsy of the mucosa of the normal small intestine was obtained a few hours after ingestion of a meal that included fried fish, French fries and ice
cream. Frozen sections were stained with oil red O and examined by light microscopy. Red streaks were observed in the lateral intercellular spaces between enterocytes. This staining was due to the presence of which of the following in those lateral intercellular spaces:

A. Adipocytes
B. Chylomicrons
C. Glycogen
D. Lacteals
E. Macrophages with numerous cytoplasmic lipid droplets (“foam cells”)

13. Trypsinogen is the precursor form of an activate enzyme. It is synthesized and secreted by __________, and is activated in the __________ by __________.

A. centroacinar cells ........ duodenum ........ an enzyme secreted by Brunner’s glands
B. chief cells ........ stomach ........ acid secreted by parietal cells
C. hepatocytes ........ space of Disse ........ an enzyme secreted by hepatic stellate (Ito) cells
D. pancreatic acinar cells ........ pancreatic ducts ........ an enzyme secreted by centroacinar cells
E. pancreatic acinar cells ........ small intestine ........ an enzyme found in the glycocalyx of enterocytes

14. The cells of the duodenum play an important role in the regulation of the pancreas by secreting:

A. Gastrin to stimulate secretion by pancreatic acinar cells
B. Motilin to inhibit secretion by pancreatic acini and islets of Langerhans
C. Secretin to stimulate secretion of bicarbonate by intercalated ducts of the pancreas
D. Somatostatin to stimulate secretion by beta cells of the pancreas

15. In tooth development (odontogenesis):

A. Ameloblasts differentiate from the outer enamel epithelium
B. The cells of the dental papilla induce the differentiation of ameloblasts
C. Ameloblast formation induces the differentiation of odontoblasts
D. Enamel induces the formation of predentin
E. Enamel formation begins at the root and progresses toward the crown
16. Kupffer cells:
   A. Are derived from fibroblasts
   B. Are located in the space of Disse
   C. Produce the reticular fiber stroma of the normal liver
   D. All the above
   E. None of the above

17. The submucosal layer:
   A. Is separated from the lamina propria by the muscularis externa
   B. Normally contains glands in the trachea, duodenum and esophagus, but not in the stomach
   C. Of the intestines contains the myenteric plexus of the enteric nervous system
   D. Of the small intestine contains the lacteals
   E. All the above

18. Skeletal muscle is a normal component of the wall of the:
   A. Appendix
   B. Esophagus
   C. Pharynx
   D. Rectum
   E. Choices A & D
   F. Choices B & C

19. Epithelial stem cells (regenerative cells) are normally found:
   A. At the base of a plica circularis
   B. At the tip of a villus
   C. In the deepest part of a gastric gland
   D. In the germinal centers of secondary lymphoid nodules
   E. Near the base of a crypt of Lieberkühn

20. Which of the following features is characteristic of the most common type of lingual papilla?
    A. They lack taste buds
B. They are common on both the anterior 2/3 and the posterior 1/3 of the dorsum of the tongue
C. Ducts of von Ebner's glands open at their base
D. Although common in young children, they are relatively few in number in adults
E. They are specialized to detect sweet taste sensations

21. Zollinger-Ellison syndrome:
   A. Affects the secretory activity of parietal cells
   B. Can be caused by a malignancy in the pancreatic islets
   C. Commonly results in duodenal or gastric ulcers
   D. Is due to excessive secretion of gastrin by malignant cells
   E. All the above

Use the diagram below to answer Question 24.

22. This diagram shows a cell from a developing tooth. This cell:
   A. Induces the differentiation of ameloblasts
   B. Is an odontoblast
   C. Is derived from the outer enamel epithelium
   D. Is lost when the tooth erupts through the gingiva
   E. Produces the hardest, most highly mineralized substance in the human body
23. The cardiac stomach:
   A. Has long straight glands
   B. Has longer pits than pyloric or fundic stomach
   C. Has the shortest (thinnest) mucosa of the three histological regions of the stomach
   D. Is the largest of the three histological regions of the stomach
   E. Lacks a muscularis mucosae

24. The region of liver tissue whose bile canaliculi all drain toward the same triad is called a:
   A. Classic hepatic lobule
   B. Hepatic acinus (of Rappaport)
   C. Porta hepatis
   D. Portal lobule
25. The following description applies to one of the junctions between different regions of the GI tract: Both regions have a simple columnar epithelium. Both are intraperitoneal. In region #1, villi are present and the longitudinal layer of the muscularis externa is uniform in thickness. Region #2 lacks villi. The longitudinal layer of muscularis externa in region #2 is very thin or absent except for three thickened, narrow, equally spaced bands. This junction is the:
   A. Gastroduodenal junction
   B. Gastroesophageal junction
   C. Ileocecal junction
   D. Jejunoileal junction
   E. Junction between cecum and appendix

26. In the stomach:
   A. Chief cells actively transport hydrogen ions into the lumen of intracellular canaliculi
   B. DNES cells produce both endocrine and exocrine secretions
   C. Goblet cells secrete a highly acidic mucus
   D. Parietal cells are found mainly in fundic stomach
   E. The pyloric region has shallow pits and short, coiled glands

27. The normal enterohepatic recirculation of bile salts most characteristically involves:
   A. Conjugation of bilirubin with glucuronic acid in the rough endoplasmic reticulum of hepatocytes
   B. *De novo* synthesis of bile acids in the smooth endoplasmic reticulum of hepatocytes
   C. Reabsorption of bilirubin from the lumen of the duodenum into the blood
   D. Secretion of bile salts into the liver sinusoids by hepatocytes
   E. All the above

28. To determine if the gall bladder was actively carrying out its main function at the time that biopsy tissue was fixed for microscopy, you examine the epithelial cells that line the lumen. By electron microscopy, active cells are most likely to show:
   A. A more extensive amount of RER
   B. A more extensive amount of SER
   C. Crystalline inclusions in their secretory vacuoles
   D. Increased amounts of lipofuscin in their residual bodies
E. Widening of the lateral intercellular spaces between epithelial cells

29. The pharyngeal tonsil:
   A. Is the type of tonsil that is removed during an adenoidectomy
   B. Is characterized by multiple deep, branching crypts
   C. Is characterized by a single short, unbranched crypt
   D. Is embedded in the dorsal surface of the posterior third of the tongue at the opening to the oropharynx
   E. Is normally covered mainly by a simple columnar epithelium

30. IgA can be carried across epithelial cells by transcytosis to be released as secretory IgA into the GI tract. There it acts, in part, by binding antigens and preventing their adherence to and penetration into the epithelium. In fact, certain bacteria are more virulent than others because they produce a protease that can degrade secretory IgA. Which of the following cells are capable of transporting IgA via transcytosis:
   A. Enterocytes
   B. Hepatocytes
   C. Paneth cells
   D. Salivary gland acinar cells
   E. All the above

31. The pancreatic islets (of Langerhans) produce two hormones that have opposing effects on appetite. These hormones are __________ and __________.
   A. Amylin from beta cells ........ grehlin from epsilon cells
   B. Amylin from epsilon cells ........ grehlin from beta cells
   C. Pancreatic polypeptide from PP (F) cells ........ somatostatin from alpha cells
   D. Preptin from alpha cells ........ gastrin from delta cells
   E. Preptin from delta cells ........ gastrin from alpha cells

32. Identify the correct statement concerning the enteric nervous system:
   A. It includes a myenteric portion that is concerned mainly with regulating the secretory activity of intestinal glands
   B. It includes ganglia located mainly in the adventitia and muscularis externa of the GI tract
   C. It requires input from the parasympathetic and sympathetic nervous systems in order to function
   D. Meissner’s plexus and Auerbach’s plexus do not communicate with one another
E. Parasympathetic stimulation increases gut motility and glandular secretion

33. With regard to tooth formation:
   A. All the tooth buds for deciduous teeth form and develop synchronously during embryogenesis
   B. Clefting of the palate can lead to dental agenesis (failure of a tooth to form)
   C. The development of the tooth root precedes development of the crown
   D. The formation of enamel precedes formation of predentin

34. Carbon tetrachloride is one of the most potent hepatotoxic agents, and hypoxia is known to increase its toxicity in vivo. In which of the following regions is hypoxia most likely to contribute to hepatocyte death after exposure to carbon tetrachloride:
   A. The center of a portal lobule
   B. The limiting plate of hepatocytes
   C. The periphery of a classic lobule
   D. Zone 1 of an hepatic acinus
   E. Zone 3 of an hepatic acinus

35. Enteroctyes of the small intestine:
   A. Are derived from the same stem cell population that produces goblet cells and Paneth cells
   B. Produce chylomicrons and release them into the lamina propria, where they enter lacteals
   C. Synthesize peptidases and disaccharidases that become incorporated into the glycocalyx, where they aid in digestion
   D. All the above
   E. Choices B & C only

36. The periodontal ligament:
   A. Causes resorption of alveolar bone wherever it exerts tensile forces (tension) on the bone
   B. Connects the tooth bud to the oral epithelium
   C. Develops from the dental papilla
   D. Includes bundles of collagen fibers called Sharpey’s fibers
   E. Is embedded into the enamel of the tooth
37. In which of the following items is a secretory product correctly paired with the cell type that synthesizes it:
   A. IgA – Parotid acinar cell
   B. Intrinsic factor – Paneth cell
   C. Pepsinogen – Pancreatic acinar cell
   D. Secretin – Chief cell of the stomach
   E. Somatostatin – Delta cell

38. In the GI tract, lysozyme is a major product of:
   A. Chief cells
   B. Esophageal glands proper
   C. I cells of the diffuse neuroendocrine system (DNES)
   D. M cells
   E. Paneth cells

39. Pernicious anemia results from a deficiency of __________, which is/are required for absorption of __________ from the __________.
   A. bile salts .......... lipoproteins .......... bile
   B. HCl .......... carbohydrates .......... duodenum
   C. intrinsic factor .......... vitamin B12 .......... ileum
   D. pepsinogen .......... peptides .......... jejunum

40. Between the palatoglossal and palatopharyngeal folds you would normally find a component of Waldeyer’s ring called the:
   A. Foliate papillae
   B. Foramen cecum
   C. Palatine tonsils
   D. Sulcus terminalis
   E. Uvula
   F. Vallate papillae

41. If you looked at a section of each of the following, in which specimen would you be most likely to find smooth and skeletal muscle mixed together in the same muscle layer?
   A. Oral pharynx
   B. Upper part of the esophagus
   C. Middle of the esophagus
   D. Distal end of the esophagus
   E. Rectum
42. Secretory units composed of large, pale-staining cells with basally located flattened nuclei are typical of:
   A. Apocrine sweat glands
   B. Mucous glands
   C. Pancreatic acini
   D. Parotid gland
   E. Serous demilunes

43. The neural tissue that is typically found between the layers of the muscularis externa of the digestive tract is most correctly described as:
   A. Meissner's plexus
   B. Sensory ganglia
   C. Sympathetic ganglia
   D. The myenteric plexus

44. Which glands are located within the submucosal layer of the duodenum?
   A. Brunner's glands
   B. Cardiac glands
   C. Crypts of Lieberkühn
   D. Seromucous glands
   E. von Ebner's glands

45. Where are chief cells most common?
   A. Mucosa covering plicae circulares
   B. Cardiac glands of the stomach
   C. Fundic glands of the stomach
   D. Crypts of Lieberkühn
   E. Dome epithelium of Peyer's patches

46. Which of the following is a salivary gland that has mainly mucous secretory units that are commonly capped with serous demilunes:
   A. Brunner's
   B. Parotid
   C. Sublingual
   D. Submandibular
   E. von Ebner's
PART II: DIRECTIONS. The following questions are negatively phrased, as indicated by the capitalized word FALSE or EXCEPT. Select the ONE lettered answer that BEST identifies the false statement.

47. Identify the FALSE statement. The parotid gland:
   A. Has a duct that empties into the vestibule of the oral cavity
   B. Is classified as a serous, compound gland
   C. Is the largest of the three major salivary glands, and produces over 60% of the volume of saliva
   D. Secretes salivary amylase
   E. Swells during infection by the mumps virus

48. Identify the FALSE statement. The anal canal:
   A. Includes an internal anal sphincter that is derived from the skeletal muscle of the pelvic diaphragm
   B. Includes the pectinate line, which marks the location of a change in the type of epithelium that lines the lumen of the canal
   C. Is continuous superiorly with the rectum
   D. Is lined in part by a simple columnar epithelium with goblet cells and enterocytes

49. Which of the following is LEAST likely to be present somewhere in the wall of the normal colon:
   A. DNES cells
   B. Enterocytes
   C. Lymphatic nodules, forming part of the GALT
   D. Lymphatic vessels
   E. Paneth cells
   F. Small fat-filled projections of the serosa that are visible on the exterior surface of the organ
ANSWERS

1. E  
2. A  
3. B  
4. D  
5. A  
6. B  
7. A  
8. B  
9. F  
10. C  
11. D  
12. B  
13. E  
14. C  
15. C  
16. E  
17. B  
18. F  
19. E  
20. A  
21. E  
22. B  
23. C  
24. D  
25. C  
26. D  
27. B  
28. E  
29. A  
30. E  
31. A  
32. E  
33. B  
34. E  
35. D  
36. D  
37. E  
38. E  
39. C  
40. C  
41. C  
42. B  
43. D  
44. A  
45. C  
46. C  
47. C  
48. A  
49. E