Biology 255 - Human Anatomy
Fourth Exam

Please print your name on the back of the last page of this exam. You must answer all questions on this exam.

Section 1: Multiple Uglies. In the following questions a series of statements are printed under a general heading. Circle the letter in front of any and all correct statements. (1 point each) Keep in mind that some, all or none of the statements may be correct. Each total question is worth the number of points indicated.

1. The peritoneum (6 points)

   a. The basic arrangement of the peritoneum follows that of the pleural membranes discussed in conjunction with the thoracic cavity.
   b. The visceral layer of the peritoneum is attached to the surface of many of the organs of the abdominal cavity.
   c. The serosal (also termed parietal) layer of the peritoneum lines the wall of the abdominal cavity.
   d. If an organ is intraperitoneal, it is covered on all sides by the peritoneum.
   e. If an organ is retroperitoneal, it is covered only on the anterior surface by the peritoneum.
   f. If an organ is secondarily retroperitoneal, the organ had a relationship with the peritoneum at one time during development, but lost it.

2. General structure of hollow organs of the gastrointestinal (G.I. or digestive) tract (4 points)

   a. All hollow organs of the G.I. tract follow the same basic organization, in that all hollow organs have the same basic number and arrangement of layers.
   b. In the hollow gastrointestinal organs the innermost layer is the mucosal layer. This layer is composed of epithelium and connective tissue, and is specialized for absorption and secretion.
   c. The muscularis layer of hollow G.I. tract organs is actually composed of two sub layers: an inner longitudinal layer of smooth muscle and an outer layer of circularly arranged smooth muscle.
   d. The mucosal layer of the hollow G.I. tract organs is specialized in that it is the only epithelial layer that is vascularized (i.e. has blood vessels).

3. Structure of esophagus and stomach (6 points)

    a. The musculature of the esophagus is designed to facilitate voluntary swallowing and the voluntary regurgitation of food immediately after the initiation of swallowing.
    b. The junction between the esophagus and stomach is marked by the presence of a sphincter. This sphincter is termed the cardiac sphincter, and prevents food from unnecessarily passing from the esophagus to the stomach.
    c. The stomach is secondarily retroperitoneal.
    d. The lesser omentum is attached to the lesser curvature of the stomach. The lesser omentum helps attach the stomach to the liver and pancreas.
    e. The mucosa of the stomach is folded. These mucosal folds (rugae) are designed to increase the absorptive and secretory surface area of the stomach and to facilitate stretching of the stomach as it fills.
    f. The mucosa of the stomach possess glands composed of three different types of cells: mucosal cells (that produce mucous), chief cells (that produce hydrochloric acid), and parietal cells (that produce pepsinogen).

4. Structure of the large and small intestines (10 points)

    a. The duodenum is the first portion of the small intestine. The first segment of the duodenum is retroperitoneal and then becomes intraperitoneal.
    b. The duodenum is in contact with the head of the pancreas.
    c. Both the jejunum and ileum are intraperitoneal
    d. The small intestine is specialized for absorption. Of these specializations (plica circularis, villi and microvilli) all but one (plica circularis) are specializations of the mucosal layer.
    e. The junction between the ileum and cecum is marked by a valve, the ileocecal valve. This valve is responsible for preventing food passing from the small intestine to the large intestine at inappropriate times.
    f. The large intestine has a significantly different function than that of the small intestine, and therefore lacks the specializations for absorption seen in the small intestine. However, the large intestine (colon) possesses several distinct specializations of its own: haustra and teniae coli.
    g. The cecum is intraperitoneal.
    h. The ascending colon is secondarily retroperitoneal.
    i. The transverse colon is initially intraperitoneal, and then becomes retroperitoneal.
    j. The descending colon is retroperitoneal.

Section 2: If the following statements are true place a (+) in the space provided; if the statement is false place a (O) in the space provided.

_____ 5. The abdominal aorta would be found to lie to the left of the vertebral column within the abdominal cavity.

_____ 6. The inferior vena cava would be found to lie superficially and to the right of the abdominal aorta within the abdominal cavity.

_____ 7. The abdominal aorta ends by the bifurcation into the common iliac arteries.

_____ 8. The celiac trunk is the first vessel to branch off of the abdominal aorta.

_____ 9. The celiac trunk subdivides into the common hepatic artery, splenic artery and right gastric artery.

_____ 10. The hepatic artery supplies the liver, gallbladder, stomach (along the greater curvature) and duodenum with blood.

_____ 11. The splenic artery supplies the stomach (along the lesser curvature), pancreas, ileum and duodenum with blood.

_____ 12. The third artery that branches off of the celiac trunk (right gastric artery) supplies the cardia of the stomach and the adjacent portion of the esophagus with blood.

_____ 13. The superior mesenteric artery branches off of the abdominal aorta inferiorly to the celiac trunk. This vessel supplies the following areas of the G.I. tract with blood: duodenum, jejunum, cecum, ascending colon, appendix, ileum and the first 2/3 of the transverse colon.

_____ 14. The inferior mesenteric artery branches off of the abdominal aorta superior to the formation of the common iliac arteries. The inferior mesenteric artery supplies the cecum, appendix, ascending colon, transverse colon, descending colon and sigmoid colon with blood.

_____ 15. The gonadal arteries (especially in women) are found to lie very close to the ureters as they (the gonadal arteries and the ureters) pass inferiorly through the abdominal and pelvic cavities.

_____ 16. The renal arteries and suprarenal arteries supply the kidneys and suprarenal glands (adrenal glands) with blood, respectively.

_____ 17. No organ of the gastrointestinal tract drains into the inferior vena cava directly.

_____ 18. The stomach, small intestine, large intestine, pancreas and gall bladder drain into the inferior vena cava via the hepatic portal vein.

_____ 19. The hepatic portal vein is formed by the union of the inferior mesenteric and splenic veins. The third vessel that participates in the formation of the hepatic portal vein is the superior mesenteric vein. This vessel will join either the splenic vein or the inferior mesenteric vein.

_____ 20. The pelvic diaphragm is formed by the levator ani and coccygeus muscles. In addition to forming the floor of the pelvic cavity these muscles also serve (function) as the voluntary sphincters for the urethra and rectum.

_____ 21. The vaginal cavity of the female would be found anterior to the rectum and posterior to the urethra.

_____ 22. The urinary bladder of the female would be found to lie anterior to the rectum and inferior to the uterus. However, the urinary bladder would be approximately at the same level as the cervix of the uterus.

_____ 23. The internal anatomy of the female clitoris and the male penis is quite similar. Both clitoris and penis have paired corpora spongiosa, while the male penis is the only one of the two structures to have a corpus cavernosum. The corpus cavernosum of the male contains the urethra.

_____ 24. All structures within the pelvis are supplied with blood via the internal iliac arteries.

_____ 25. The male urethra is subdivided into 3 parts. The involuntary sphincter would be found associated with the membranous urethra.

_____ 26. The broad ligament attaches the uterus to the bony pelvis of the pelvic cavity.

____ 27. Collect 2 free points by writing your initials in the space provided.

____ 28. When viewing a cadaver or the anatomical models in the lab it is possible to differentiate between the ileum and jejunum easily at any segment of the small intestine.

_____ 29. The cecum and vermiform appendix are both normally located in the lower left quadrant of the abdominal cavity (left iliac region).

_____ 30. In the female, the uterus is found to be superior to the urinary bladder and anterior to the terminal portion of the sigmoid colon and the entire length of the rectum. These anatomical relationships are responsible for the difficulties many pregnant women have with urination and defecation.

_____ 31. In the female, the ureters have significant anatomical relationships with other structures in the pelvic cavity that may cause difficulty should the woman need to undergo gynecological surgical procedures. One of these relationships is the close proximity of the ureter to the ovarian artery, ovarian vein and ovary (with the ureter found posterior of these structures).

_____ 32. In the female, the suspensory ligament of the ovary attaches the ovary to the uterus and uterine (Fallopian) tubes.

_____ 33. Normal fertilization occurs within the uterus of the female.

_____ 34. In the male, swelling of the prostate will affect the urination process due to the fact that swelling of the prostate will cause a constriction of the membranous urethra.

_____ 35. The prostate gland of the male pelvis is found immediately inferior to the bladder and surrounds the first portion of the male urethra. This is the portion of the urethra that contains the involuntary sphincter, which is formed by the coccygeal muscle.

_____ 36. For two free points, draw your best picture of a witch in the space.

Section 3: Define the following anatomical terms in the space provided. (2 points each)

37. sagittal plane

38. contralateral

39. hamulus

40. cecum

41. cornu

42. corona

43. infundibulum

44. plica