Abdominal pain 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 seminal vesicles:
   A. Are characterized histologically by the presence of folds called plicae palmitae
   B. Are directly continuous with the epididymis
   C. Require testosterone to maintain optimal secretory activity
   D. Secrete a mucus whose main function is to act as a lubricant
   E. Usually contain layered structures called concretions in their lumen

2. Which of the following contributes most directly to the onset of menstruation:
   A. Decreased pH in the uterine lumen due to the metabolic conversion of glycogen to lactate by bacteria
   B. High levels of human chorionic gonadotropin (HCG) due to lack of fertilization
   C. High levels of relaxin secreted by the corpus luteum
   D. Ischemia due to prolonged contraction of the spiral arteries of the endometrium

3. The ampulla of the oviduct is the most common site of:
   A. Completion of meiosis II
   B. Fertilization
   C. Implantation
   D. All the above
   E. A and B only

4. Most of the glomerular filtrate’s original volume is reabsorbed in the proximal convoluted tubule. Active transport of sodium contributes significantly to the reabsorption process. Which of the following is a structural feature of proximal convoluted tubule cells that is consistent with their specialization for active transport:
   A. Infoldings of the basal plasmalemma
   B. Junctional complexes between the cells of the tubules
   C. Rows of mitochondria that form eosinophilic striations in the basal region of the cells
   D. All the above
5. Medullary rays:
   A. Are bisected by interlobular arteries
   B. Are part of the renal medulla
   C. Form the core of each renal lobe
   D. Include straight proximal tubules and straight distal tubules
   E. All the above

6. During the early secretory phase of the uterine cycle:
   A. Glycogen first accumulates at the apical end of the uterine gland cells, and then later in the cycle it shifts to the basal end of the cells
   B. The number of neutrophils in the endometrial stroma reaches its peak
   C. The uterine glands of the stratum functionale are sacculated (“saw-toothed”) in shape
   D. There is a corpus hemorrhagicum or corpus luteum in the ovary

7. Benign prostatic hypertrophy:
   A. Causes obstruction of the penile urethra
   B. Is due to decreased synthesis of dihydrotestosterone (DHT) by prostatic stromal cells
   C. Is most often diagnosed by detecting increased serum levels of prostate-specific antigen
   D. Is often successfully treated with sildenafil (Viagra)
   E. Occurs most commonly in the periurethral zone of the gland

8. In the uterus, the process of decidualization:
   A. Occurs at the same time as the follicular phase of the ovarian cycle
   B. Occurs during the proliferative phase of the uterine cycle
   C. Refers to changes in the stromal cells of the endometrium
   D. Refers to changes in the uterine gland cells
   E. All the above
   F. Choices A & B only

9. Primordial follicles:
   A. Are characterized by a single layer of cuboidal follicular cells
   B. Are located deep in the cortex, closest to the medulla
   C. Contain primary oocytes
   D. Form in the ovary shortly after birth
   E. Would not be found in the ovary until after the onset of puberty
10. A decrease in blood volume due to a hemorrhage activates a compensatory system that raises blood volume and blood pressure. In what way is the kidney involved in this system?
   A. Extraglomerular mesangial cells secrete nephrin
   B. Interstitial cells of the medulla secrete aldosterone
   C. Juxtaglomerular cells (granular cells) secrete renin
   D. Podocytes secrete angiotensinogen
   E. All the above

Use the following information to answer questions #11 & 12
One target for developing a male contraceptive is the process by which late spermatids are released from the seminiferous epithelium into the lumen of the seminiferous tubule as free spermatozoa.

11. This process of release is called __________, and it involves the formation of the __________.
   A. spermiation .......... manchette
   B. spermiation .......... polar body
   C. spermiation .......... residual body
   D. spermiogenesis .......... manchette
   E. spermiogenesis .......... polar body
   F. spermiogenesis .......... residual body

12. Although it is highly unlikely, suppose that a contraceptive drug were discovered that could selectively prevent the release of spermatozoa from the seminiferous epithelium with 100% efficacy starting at day 1 of drug use. The contraceptive effect of the drug would still not be complete until all the previously released viable sperm had completed their journey through the male reproductive tract. How long on average does it take for released spermatozoa to travel from the seminiferous tubules to the epididymis?
   A. 12 days
   B. 28 days
   C. 74 days
   D. 86 days

13. Which of the following is true of granulosa lutein cells:
   A. They are derived from the theca interna
   B. They are separated from the theca lutein cells by the zona pellucida
   C. They are small and dark-staining compared to the theca lutein cells
   D. They form an avascular layer of cells
   E. They secrete progesterone
14. Lysis of the rigid sickled erythrocytes in patients with sickle cell anemia reduces the oxygen-carrying capacity of the blood and stimulates the secretion of which substance from the kidney:
   A. Aldosterone
   B. Angiotensin I
   C. Angiotensinogen
   D. Erythropoietin
   E. Renin

15. Which of the following features is characteristic of the urinary pole of the renal corpuscle:
   A. An abrupt change from simple squamous to simple cuboidal epithelium
   B. Extraglomerular mesangial cells
   C. Juxtaglomerular cells (granular cells)
   D. The point of reflection where the parietal layer of Bowman’s capsule becomes continuous with the visceral layer
   E. All the above
   F. Choices B, C, & D only

16. In the female reproductive tract, engorgement of blood vessels:
   A. Causes the spiral arteries of the uterus to become straight arteries near the time of menstruation
   B. Causes the fimbriae of the oviduct to extend toward the ovary near the time of ovulation
   C. Occurs in the wall of the vagina in response to sexual arousal
   D. All the above
   E. A and B only
   F. B and C only

17. The urethra:
   A. Of both male and female has a muscularis mucosae, and a muscularis externa that is composed of inner longitudinal, middle circular, and outer longitudinal layers
   B. Of both male and female has a serosa throughout its length
   C. Of both male and female passes through a layer of skeletal muscle that forms the voluntary urethral sphincter
   D. Of the female opens into the cervix
   E. Of the male has a penile portion that is lined by transitional epithelium
18. Which of the following statements is/are true regarding prostate-specific antigen (PSA):
   A. It is a yellowish compound whose main function is to serve as a source of nourishment for the sperm
   B. It is normally found in the serum of healthy males
   C. It is only produced by the prostate
   D. It reaches the prostatic urethra by traveling through the ejaculatory duct
   E. Serum PSA levels are only elevated in patients who have prostate cancer

19. With regard to the blood supply of the kidney:
   A. Arcuate arteries pass near the border between the cortex and the bases of the renal pyramids
   B. Interlobar arteries pass between pyramids
   C. Peritubular capillaries and vasa recta arise from efferent arterioles
   D. The kidney contains an arterial portal system that involves the fenestrated glomerular capillaries
   E. All the above

20. Functions of the __________ include phagocytizing residual bodies, secreting decapacitation factors that inhibit the ability of sperm to fertilize an ovum, and contributing to the movement of sperm along the male reproductive tract by absorbing fluid from the lumen:
   A. Bulbourethral glands
   B. Efferent ductules
   C. Epididymis
   D. Seminal vesicle
   E. Sertoli cells

21. Mutation in a gene coding for one of the alpha chains of type IV collagen causes Alport’s syndrome (hereditary glomerulonephritis), which is characterized in part by proteinuria (excessive amounts of protein in the urine), and progressive renal failure. This mutation has its primary effect on which component of the renal corpuscle:
   A. Filtration slit membrane
   B. Glomerular basement membrane
   C. Glomerular capillary endothelial cells
   D. Intraglomerular mesangial cells
   E. Pedicles of the podocytes
22. Atresia of ovarian follicles:
   A. Involves apoptosis in the membrana granulosa cells of secondary follicles
   B. Is a rare phenomenon
   C. Occurs only after puberty
   D. Occurs only during embryogenesis
   E. Occurs only in secondary follicles and Graafian follicles
   F. Choices B & D only

23. A 28-year old male consults a fertility specialist. His sperm count is normal, but the great majority of his sperm are nonmotile. In normal males, sperm first become motile in the:
   A. Ampulla of the vas deferens
   B. Epididymis
   C. Female reproductive tract
   D. Seminal vesicles
   E. Seminiferous tubules

24. Mutations in the gene coding for the protein nephrin are associated with a serious condition called congenital nephrotic syndrome, which most commonly affects families of Finnish origin. Nephrin is found in:
   A. Intraglomerular mesangial cells
   B. The filtration slit membrane
   C. The fusiform vesicles of transitional epithelial cells
   D. The glomerular basement membrane
   E. The secretory granules of juxtaglomerular cells

25. A 48 year-old male undergoes a successful vasectomy by the most common technique, namely transection of the vas deferens in the spermatic cord. In a sample taken six months after this procedure, which of the following should be absent from his ejaculate:
   A. Flavins that cause the semen to fluoresce under UV light
   B. Fructose, semenogelin, and prostaglandins from the seminal vesicles
   C. Mucus from the bulbourethral glands
   D. Prostate-specific antigen, fibrinolysin, and acid phosphatase from the prostate
   E. All of the substances listed above should be absent
   F. None of the substances listed above should be absent
26. A corpus luteum:
   A. Develops during the proliferative phase of the uterine cycle
   B. Develops from a corpus albicans
   C. Includes theca lutein cells derived from the theca externa of the ovarian follicle
   D. Is avascular
   E. Is maintained during the early stages of pregnancy by substances such as human chorionic gonadotropin (hCG)
   F. Secretes estrogens, but cannot produce progesterone

27. Fertilization of an ovum:
   A. Involves capacitation of sperm in the female reproductive tract
   B. Involves the development of hypermotility in the sperm (whip-like movement of the sperm tail)
   C. Involves the release of enzymes from the acrosome (acrosome reaction)
   D. Most often occurs in the ampulla of the oviduct
   E. All the above

28. Intercalated cells (dark cells) help to regulate the pH of urine by secreting either H+ or bicarbonate. Intercalated cells are found:
   A. Between podocytes and glomerular capillary endothelial cells
   B. Between the afferent and efferent glomerular arterioles at the vascular pole of a renal corpuscle
   C. In collecting tubules
   D. In the connective tissue between tubules of the renal medulla
   E. In the macula densa

29. Renin:
   A. Indirectly causes secretion of aldosterone from the zona glomerulosa of the adrenal cortex
   B. Is an enzyme
   C. Is secreted in response to stimuli such as low blood pressure due to hemorrhage
   D. Is synthesized in the wall of afferent glomerular arterioles
   E. All the above

30. Finasteride is useful in the treatment of benign prostatic hypertrophy (BPH) because it inhibits the production of a substance that maintains the activity of the gland. That substance is:
A. Androgen-binding protein
B. cGMP
C. Dihydrotestosterone
D. Prostate-specific antigen
E. Testis-determining factor

31. In which of the following items is a cell type correctly matched with its description:
   A. Juxtaglomerular cells ..... phagocytic cells that lie between the afferent and efferent glomerular arterioles at the vascular pole of a renal corpuscle
   B. Macula densa cells ..... modified smooth muscle cells that secrete renin
   C. Mesangial cells ..... cells that form the visceral layer of Bowman’s capsule
   D. Medullary interstitial cells ..... cells that resemble myofibroblasts
   E. Podocytes ..... cells that form the parietal layer of Bowman’s capsule

32. During oogenesis, the first meiotic division begins:
   A. At the time of fertilization
   B. At the time of ovulation
   C. During embryogenesis of the female
   D. In primary oocytes located in primary follicles
   E. In primary oocytes located in secondary follicles

33. The human ureter:
   A. Has a serosa
   B. Is capable of peristalsis
   C. Is directly formed by the merger of the major calyces
   D. Is lined by a ciliated epithelium
   E. Is surrounded in its distal third by the cremaster muscle

34. Division of a primary spermatocyte:
   A. Occurs extremely rapidly
   B. Occurs via the process known as meiosis I
   C. Results in the disruption of the cytoplasmic bridges that connect primary spermatocytes to one another
   D. Results in formation of one secondary spermatocyte and one polar body
   E. All the above
35. The zona pellucida:
   A. Forms during the primary follicle stage of oogenesis
   B. Is also called the glassy membrane
   C. Is composed of mainly of collagen type IV
   D. Prevents communication between the oocyte and adjacent follicular cells
   E. Remains within the follicle after ovulation

36. In the male reproductive system, the process known as emission:
   A. Delivers the ejaculate to the base (or bulb) of the penile urethra
   B. Involves contraction of the ductus deferens and seminal vesicle
   C. Is under the control of the sympathetic nervous system
   D. Precedes the contraction of the bulbospongiosus muscle
   E. All the above

37. Fimbriae:
   A. Are mucosal folds found throughout the length of the oviduct
   B. Are present only in the isthmus
   C. Have stereocilia that absorb fluid, thus creating a current that helps to move an ovum through the oviduct
   D. Help to insure that an ovum will enter the oviduct following ovulation
   E. Lengthen and shorten as a result of contraction of longitudinal smooth muscle bundles that form their core

38. The stratum basalis of the uterus:
   A. Contains long straight glands that are not shed during menstruation
   B. Is less basophilic than the stratum functionalis due to the more edematous stroma of the basalis
   C. Is responsible, via mitosis of its gland cells, for re-epithelializing the luminal surface of the uterus following menstruation
   D. Is the deepest layer of the uterine perimetrium

39. The human urinary bladder has:
   A. A lumen that is lined entirely by transitional epithelium
   B. A muscularis externa formed by three well defined layers (inner circular, middle longitudinal, and outer circular)
   C. A muscularis mucosae called the detrusor muscle
   D. An adventitia, but no serosa
   E. Mucus-secreting glands of Littré throughout its submucosa
40. A major secretory product of uterine glands is:
   A. Anti-Müllerian hormone (AMH), also called Müllerian duct-inhibiting substance (MIS)
   B. Glycogen
   C. Inhibin
   D. Oocyte maturation inhibitor (OMI)
   E. Progesterone

41. Which of the following is/are mainly responsible for forming the blood-testis barrier:
   A. Capillary endothelial cells of the testis
   B. Leydig cells
   C. Myoid cells of the seminiferous tubules
   D. Sertoli cells
   E. Tunica albuginea of the testis

42. A cycle of the seminiferous epithelium in humans is the time it takes for:
   A. A newly formed spermatozoan to reach the tail of the epididymis
   B. A spermatogonium to mature into a spermatozoan
   C. An area of seminiferous epithelium to go through all 6 of the cellular associations (stages) characteristic of human seminiferous tubules
   D. An individual spermatocyte to complete meiosis I and II

43. Which of the following is the latest event to occur during the morphological maturation of an early spermatid into a spermatozoan:
   A. Formation of the acrosomal cap
   B. Formation of the end piece
   C. Reorientation of the spermatid so that its head points toward the basement membrane of the seminiferous tubule and its tail extends toward the lumen of the tubule
   D. Shedding of the residual body
   E. The Golgi phase of maturation

44. Podocytes:
   A. Form the first layer of the filtration barrier that is encountered by blood plasma
   B. Form filtration slits between pedicels of the podocyte processes
   C. Form the parietal layer of Bowman's capsule
   D. Are phagocytic
   E. Are separated from the urinary space by a basement membrane
45. The prostatic urethra:
   A. Is entirely lined by a pseudostratified columnar epithelium with stereocilia
   B. Is surrounded by erectile tissue
   C. Is surrounded by skeletal muscle that forms the voluntary external urethral sphincter
   D. Receives the openings of the ejaculatory ducts
   E. Receives the secretions of the mucosal glands, which are located in the peripheral zone of the prostate

PART II: DIRECTIONS. Each of the numbered items or incomplete statements in this section is negatively phrased, as indicated by a capitalized word such as INCORRECT, FALSE, or EXCEPT. Select the ONE lettered answer or completion that is BEST in each case.

46. Your 24-year old patient requests information on how to estimate the time of ovulation because she and her partner want to have a child. One of the topics you discuss is cervical mucus. All the following are changes that occur in cervical mucus near the time of ovulation EXCEPT:
   A. The mucus becomes less viscous, allowing sperm to move more easily through the cervix
   B. The mucus becomes more highly stretchable
   C. The mucus has a higher salt concentration, which produces a “ferning” pattern when the mucus is allowed to dry on a glass slide
   D. There is a decrease in the amount of cervical mucus that is secreted

47. The uterine tubes contain all the following EXCEPT:
   A. A region called the ampulla, which is interposed between the infundibulum and the isthmus
   B. A thicker muscularis near the uterus than near the fimbriae
   C. Ciliated cells that beat toward the uterus
   D. Mucosal folds that are most abundant and most highly branched in the ampulla
   E. Peg cells that secrete progesterone, and are most abundant during the follicular phase of the cycle
48. Identify the **FALSE** statement. Prophase of meiosis I:
   
   A. Includes several stages such as leptotene, zygotene, pachytene and diplotene, which are morphologically distinguishable in primary spermatocytes
   
   B. Involves the pairing of homologous maternal and paternal chromosomes
   
   C. Lasts approximately 22 days in human males
   
   D. Occurs in secondary spermatocytes in the male, and in secondary oocytes in the female

49. Identify the **FALSE** statement. The theca interna:
   
   A. Becomes the glassy membrane of atretic follicles
   
   B. Develops from the stroma of the ovary
   
   C. Has LH receptors on its secretory cells
   
   D. Has secretory cells that are rich in smooth endoplasmic reticulum (SER)
   
   E. Produces androgens

50. Identify the **FALSE** statement. The epithelium of the oviduct:
   
   A. Is simple columnar
   
   B. Includes ciliated cells whose cilia beat toward the uterus
   
   C. Includes peg cells that secrete nutrients for the ovum and sperm
   
   D. Increases in height during the proliferative phase, under the influence of estrogen
   
   E. Contains varying proportions of ciliated cells vs. peg cells at different times during the menstrual cycle
   
   F. Secretes mucus that becomes less viscous at the time of ovulation
ANSWERS

2. D 27. E
3. E 28. C
4. D 29. E
5. D 30. C
6. D 31. D
7. E 32. C
8. C 33. B
9. C 34. B
10. C 35. A
11. C 36. E
12. A 37. D
13. E 38. C
14. D 39. A
15. A 40. B
16. F 41. D
17. C 42. C
18. B 43. D
19. E 44. B
20. C 45. D
22. A 47. E
23. B 48. D
24. B 49. A
25. F 50. F