#1 - #18 MULTIPLE CHOICE QUESTIONS:

1. Regarding the renal corpuscle, which of the following is CORRECT:
a) the parietal layer of Bowman's capsule is composed of podocytes
b) the urinary space contains glomerular filtrate
c) arterioles enter and exit at the urinary pole
d) all of the above
e) none of the above

2. Which of the following is/are part to the glomerular filtration barrier:
a) basement membrane between podocytes and capillary endothelial cells
b) slit diaphragms between foot processes of podocytes
c) fenestrations of glomerular capillary endothelial cells
d) all of the above
e) none of the above

3. Regarding the proximal tubule of the kidney, which of the following is CORRECT:
a) consists of a simple squamous epithelium
b) moves peritubular sodium into the tubule lumen
c) communicates with the macula densa via gap junctions
d) all of the above
e) none of the above

4. Which of the following is a function of the juxtaglomerular cells of the kidney:
a) secrete renin
b) secrete aldosterone
c) secrete antidiuretic hormone (ADH/Vasopressin)
d) all of the above
e) none of the above

5. Which of the following dynamically regulate water movement across the epithelium of the collecting tubules of the kidney:
a) adherens junctions
b) vasa recta
c) aquaporins
d) all of the above
e) none of the above

6. Which of the following prominent cell-cell junctions that are critical during the changes in cell shape that can occur in a transitional epithelilum:
a) tight junctions
b) adherens junctions
c) gap junctions
d) desmosomes
e) hemidesmosomes

7. Which of the following is found in the vascular loose connective tissue of the testis:
a) Leydig cells
b) rete testis
c) tunica albuginea
d) all of the above
e) none of the above

8. Which of the following contains smooth muscle in its wall that facilitates ejaculation:
a) ductuli efferentes
b) ductus (vas) deferens
c) ejaculatory duct
d) all of the above
e) none of the above

9. Regarding the prostate gland, which of the following is FALSE:
a) it is a compound gland
b) it is a tubuloalveolar gland
c) the parenchyma secretes a protease
d) smooth muscle cells are intermingled with connective tissue collagen fibers in the stroma
e) the parenchyma and the stroma are both testosterone-responsive

10. Which of the following maintains the flaccid state of erectile tissue in the penis:
a) the parasympathetic nervous system
b) increased blood flow through arteriovenous anastamoses
c) relaxation of the smooth muscle in the walls of arteries that supply the venous sinuses
d) all of the above
e) none of the above

11. Which of the following occurs during the follicular phase of the ovarian cycle:
a) theca interna cells produce androstenedione
b) granulosa cells produce estrogen
c) zona pellucida forms
d) all of the above
e) none of the above

12. Which of the following occurs just prior to ovulation:
a) a surge of follicle stimulating hormone
b) a surge of luteinizing hormone
c) a surge of human chorionic gonadotropin
d) all of the above
e) none of the above

13. Which of the following BEST describes the corpus albicans:
a) precursor of the corpus luteum
b) corpus luteum of pregnancy
c) degenerating corpus luteum
d) is part of the tunica albuginea of the ovary
e) is part of the ovarian surface (germinal) epithelium

14. Regarding the proliferative phase of the uterine cycle, which of the following is CORRECT:
a) occurs during days 1- 4 of the menstrual cycle
b) occurs during days 4-14 of the menstrual cycle
c) occurs during days 14-28 of the menstrual cycle
d) occurs in the first few days after fertilization
e) occurs during the last trimester of pregnancy

15. Which of the following is MOST responsible for initiating the LOSS of the functional layer of the uterine endometrium during menstruation:
a) constriction of the straight arteries
b) constriction of the helical arteries
c) increased estrogen production
d) increased progesterone production
e) fertilization of the oocyte

16. During the secretory phase of the uterine cycle, which of the following acts directly on the endometrium to increase its size and thickness:
a) leuteinizing hormone (LH)
b) follicle stimulating hormone (FSH)
c) estrogen
d) progesterone
e) oxytocin

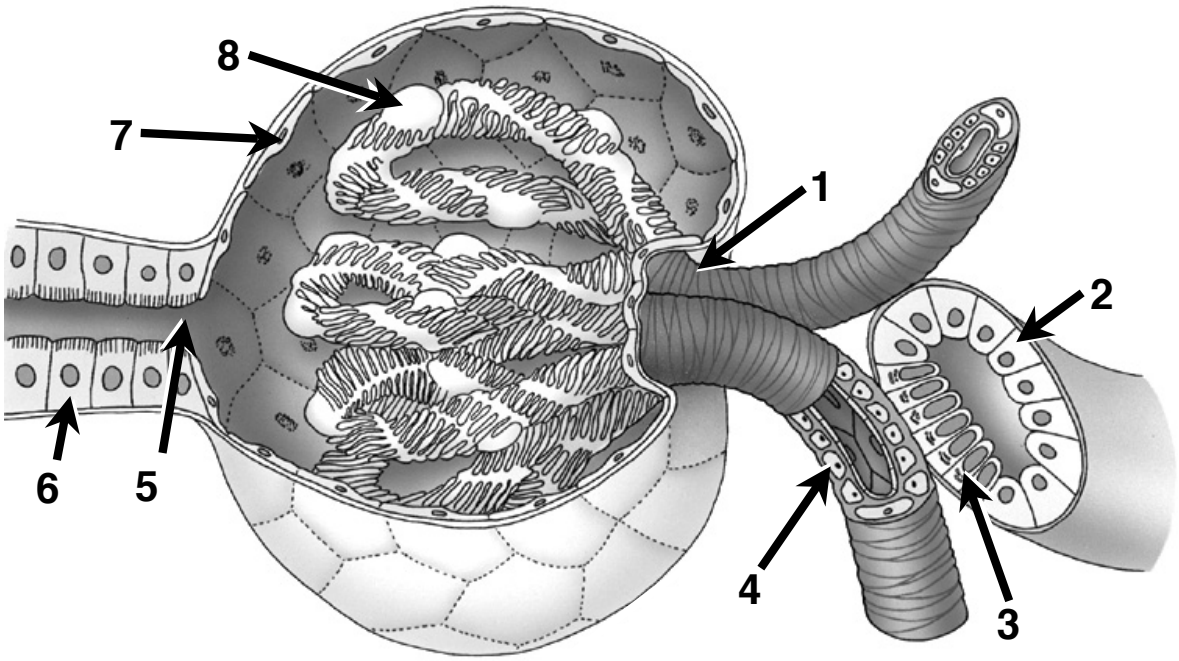
17. In the female reproductive tract, which of the following is lined by a stratified squamous, non-keratinizing epithelium:
a) vagina
b) cervix
c) uterus during the proliferative phase of the uterine cycle
d) uterus during the secretory phase of the uterine cycle
e) oviduct

18. Which of the following are LEAST prominent in the alveolar cells of the lactating breast:
a) basally-located oxytocin receptors
b) basally-located hemidesmosomes
c) apically-located microvilli
d) cytoplasmic lipid droplets
e) secretory vesicles containing the milk protein casein

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

#19-#31 SHORT ANSWER QUESTIONS; PLEASE ANSWER DIRECTLY ON EXAM

Fig 1: Renal Corpuscle & Associated Structures



19. In Fig 1, which numbered structure best represents the urinary pole:
(write the number) **5**

20. In Fig 1, which numbered structure best represents a cell that is part of the parietal layer of Bowman's capsule:
(write the number) **7**

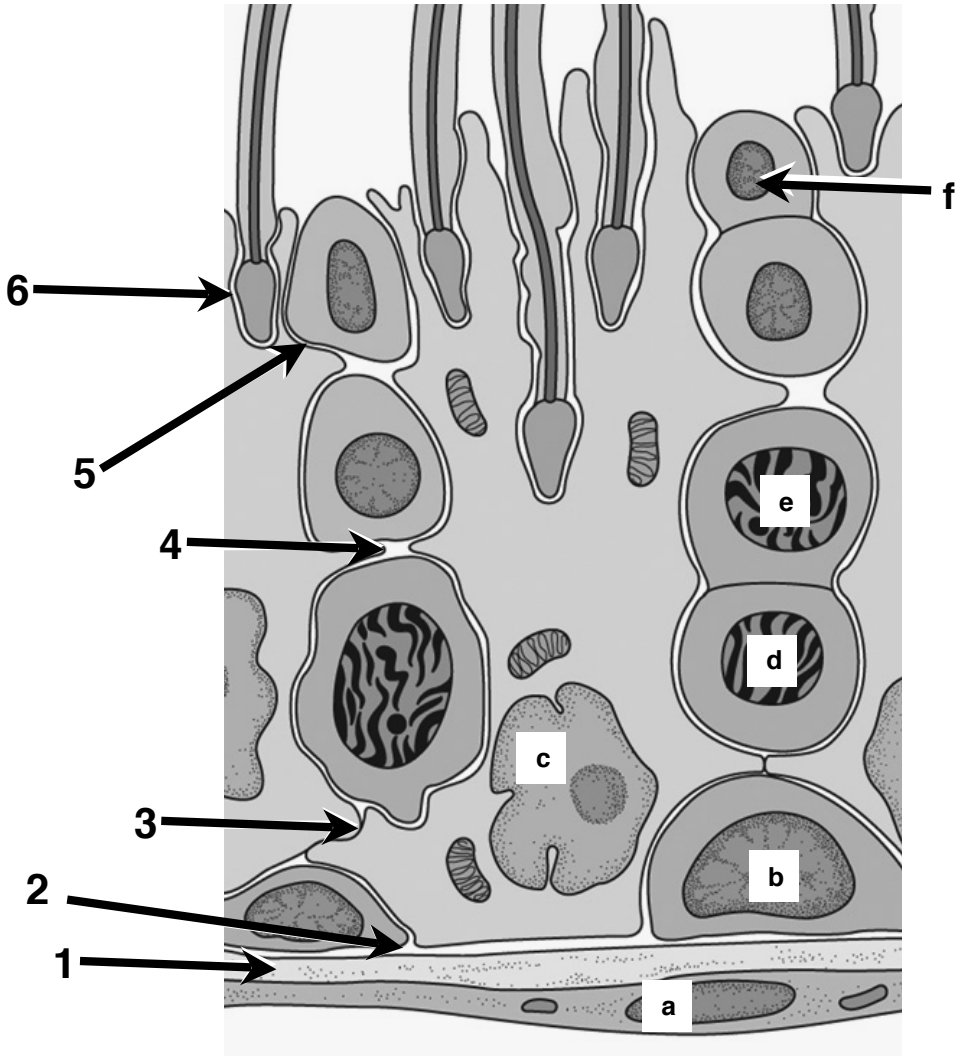
21. In Fig 1, which numbered structure directly responds to changes in urine volume in the distal tubule:
(write the number) **3**

22. Name the morphological specializations that increase the apical surface area of the cell that is structure #6 in Fig 1:
(name the specializations) **microvilli**

23. Name the cell type that is structure #8 in Fig 1:
(name the cell type) **podocyte**

End of Questions Related to Fig 1

Figure 2 - Seminiferous Tubule



24. In Fig 2, which numbered structure is the site where the tight junctions are located that most contribute to the blood-testis barrier:

(write the number) **3**

25. In Fig 2, what is the name of structure #1, which is extracellular:

(name the structure) **basement membrane or basal lamina**

26. In Fig 2, which lettered cell is in the germ cell lineage and is NOT sequestered from the immune system (i.e. immunoprotected):

(write the letter) **'b'**

27. What is the chromosome number of cell **'d'** in Fig 2:

(haploid? diploid? tetraploid?) **haploid (or 23)**

28. Name the cell type that is represented by **'c'** in Fig 2:

(name the cell type) **Sertoli cell**

End of Questions Related to Fig 2; Proceed to narrative questions

29. A mythical CAPS 390 student with an interest in ciliary motility lost his notes on the male reproductive system before he undertook a 4th year cell biology research project where he tried to isolate microtubule motors from the cilia of epididymal epithelial cells. After six months he gave up in disgust. **Why was the student unable to isolate ciliary microtubule motors from the apical appendages of epididymal cells?**

No microtubules in sterocilia (they are really long microvilli)

30. A mythical CAPS390 TA's grandmother who had been post-menopausal for approximately 20 years fell and broke her hip. During the early stages of her recovery she was put on 'fosamax' (a bisphosphonate that inhibits of osteoclast activity). **What occured at menopause that contributed to the emergence of the condition that led to fosamax treatment?**

Loss of estrogen production at menopause

31. A not-so mythical CAPS390 instructor recently stayed up really late to work on a lecture. To help stay awake he drank way too much caffeinated coffee, which he rarely drinks. This led to an increase in diuresis. The next morning he was quite thirsty**. Why?**

Mild dehydration due to high volume of urine produced

End of Sample Question Set #6