Excretory Lecture Test Questions – Set 2

1. Nephron filtration occurs in the:
   a. collecting duct
   b. loop of Henle
   c. vasa recta
   d. capsule
   e. proximal convoluted tubule

2. Substances which should not pass through Bowman's capsule during filtration:
   a. sugars, fats and salts
   b. fatty acids and water
   c. blood cells and plasma proteins
   d. salts, amino acids and plasma proteins
   e. nonexistent, since all blood components are filtered out

3. Which of the following is not normally filtered into Bowman's capsule:
   a. plasma proteins
   b. sodium
   c. glucose
   d. urea
   e. amino acids

4. An opposing force to glomerular filtration, due to the attraction of plasma proteins is:
   a. capsular fluid (hydrostatic) pressure
   b. interlobular venous pressure
   c. efferent pressure
   d. colloid osmotic pressure
   e. incontinence

5. High glomerular capillary pressure is maintained because:
   a. the loop of Henle has a hairpin turn
   b. the capillaries are within arterioles (afferent and efferent), rather than between an arteriole and a venule
   c. of the smaller diameter of the efferent, than the afferent arteriole
   d. of higher renal arterial blood pressure, when compared with other organs
   e. all of the above, except "a"

6. The rate of filtration for both kidneys together is:
   a. 125 ml/min
   b. 2 L/min
   c. 500 ml/min
   d. 25 ml/min
   e. 25 L/min

7. The reason for the efferent arteriole being smaller than the afferent arteriole:
   a. increase glomerular blood pressure
   b. decrease glomerular blood pressure
   c. slow blood flow into the vasa recta
   d. increase blood flow into the vasa recta
   e. there is no logical reason

8. Blood is originally supplied to the nephron by:
   a. peritubular capillaries
   b. micturition
   c. vasa recta
   d. counter-current mechanism
   e. glomerulus

9. Which of the following would be the highest pressure:
   a. efferent arteriolar
   b. afferent arteriolar
   c. net filtration
   d. colloid osmotic
   e. capsular fluid

10. Which of the following would not normally be filtered in any significant amount:
   a. blood cells
   b. vitamins (water soluble)
   c. amino acids
   d. salts
   e. glucose

11. If the glomerular blood contains a glucose concentration of 95 mg/100 ml, the capsular filtrate should have:
   a. 950 mg
   b. 9.5 mg
   c. 95 mg
   d. 9.5 g
   e. none, since it is not permeable

12. The relative concentrations of permeable substances are the same in the capsular filtrate as in the glomerulus and peritubular capillaries. This concept is termed:
   a. ultrafiltrate
   b. colloid osmotic pressure
   c. homeostasis
   d. micturition
   e. secretion

13. Obligatory water reabsorption occurs from the:
   a. proximal convoluted tubule
   b. ascending limb of Henle
   c. distal convoluted tubule
   d. collecting tube
   e. all of the above

14. Which of the following solutes in the filtrate is the least reabsorbed:
   a. glucose
   b. vitamins
   c. amino acids
   d. sodium
   e. creatinine

15. Which of the following constituents of the filtrate is completely reabsorbed, regardless of its concentration:
    a. glucose
    b. amino acids
    c. creatinine
    d. urea
    e. none of the above, since there are upper limits

16. Tubular reabsorption is:
    a. active
    b. passive
    c. both active and passive
    d. filtration
    e. ionic only

17. The removal of filtrate components from the nephron or collecting system, back into the body fluids, is:
    a. filtration
    b. reabsorption
    c. secretion
    d. micturition
    e. excretion

18. All of the following substances undergo reabsorption, except:
    a. glucose
    b. water
    c. creatinine
    d. amino acids
    e. sodium

19. If a particular substance was filtered, but none appeared in the urine, then it has been:
    a. transported by facilitated diffusion
    b. not reabsorbed at all
    c. entirely secreted
    d. partly secreted and partly reabsorbed
    e. entirely reabsorbed

20. Facultative water reabsorption occurs from the:
    a. distal convoluted tubule and collecting duct
    b. ascending limb of Henle
    c. descending limb of Henle
    d. proximal convoluted tubule
    e. Bowman's capsule

21. The main process which determines the composition of the urine:
    a. secretion
    b. reabsorption
    c. filtration
    d. peripheral resistance
    e. micturition

22. Which mineral is the most reabsorbed:
    a. potassium
    b. sodium
    c. magnesium
    d. phosphate
    e. bicarbonate

23. In which portion of the nephron is water reabsorbed by active transport:
    a. proximal convoluted
    b. descending thin segment
    c. ascending thin segment
    d. distal convoluted
    e. none of the above--water can never be actively transported

24. Some substances are mostly or entirely reabsorbed in the proximal portions of the nephron. This is because they:
    a. are of critical importance in the body fluids
    b. are extremely toxic
    c. can only be actively transported
    d. can only be passively transported
    e. would be prevented from being reabsorbed after passing through the loop of Henle

25. Critically important substances are mostly, or entirely, reabsorbed in which region:
    a. distal convoluted
    b. thin segment
    c. collecting tubule
    d. proximal convoluted
    e. vasa recta

26. The following two substances always follow each another:
    a. hydrogen and water
    b. sodium and water
    c. sodium and chloride
    d. sodium and potassium
    e. water and renin

27. If the capsular filtrate contains a sodium concentration of 150 mEq/L, what would be the most likely concentration by the end of the proximal convoluted tubule:
    a. 15 mEq/L
    b. 1500 mEq/L
    c. 150 mEq/L
    d. O mEq/L
    e. 1.5 mEq/L

28. The counter-current mechanism does not directly depend upon:
    a. the structural relationships of the various parts of the nephron and collecting system
    b. medullary fluid concentrations
    c. colloid osmotic attraction of blood within the glomerulus
    d. the vasa recta's opposing "currents"
    e. variable nephron permeabilities in different portions

29. The counter-current mechanism operates because of:
    a. the structural relationships of the nephron portions and collecting system
    b. medullary fluid concentrations
    c. differential nephron permeabilities in various portions
    d. the vasa recta's opposing "currents"
    e. all of the above are involved

30. Which of the following is actively transported into the ascending limb of the nephron:
    a. water
    b. urea
    c. chloride
    d. sodium
    e. none of the above, since this would be the wrong direction

31. In the descending limb of the nephron, due to the effects of the ascending limb:
    a. sodium diffuses out
    b. water diffuses in
    c. sodium diffuses in
    d. sodium is actively transported in
    e. none of the above

32. The greatest water concentration is in the:
    a. capsular filtrate
    b. proximal convoluted tubule
    c. beginning of the distal convoluted tubule
    d. thin loop of Henle
    e. medullary tissue fluid

33. Which of the following is permeable to water:
    a. Bowman's capsule
    b. proximal convoluted tubule
    c. descending limb of Henle's loop
    d. collecting tubule
    e. all of the above

34. Which of the following is not permeable to water:
    a. ascending thin and thick segments
    b. descending thin limb of Henle
    c. collecting tubule
    d. most of the proximal convoluted tubule
    e. Bowman's capsule

35. The least sodium concentration should be in the:
    a. capsular filtrate
    b. proximal convoluted tubule
    c. bottom of thin loop of Henle
    d. beginning of distal convoluted tubule
    e. lower medullary tissue fluid

36. The greatest sodium concentration should be in the:
    a. glomerular filtrate
    b. proximal convoluted tubule
    c. descending limb of Henle
    d. collecting tubule
    e. ascending portion of the vasa recta

37. Where is sodium actively transported out of the nephron:
    a. descending limb
    b. proximal convoluted tubule
    c. ascending limb
    d. papillary duct
    e. collecting tubule

38. Where is chloride actively transported out of the tubule:
    a. descending limb
    b. proximal convoluted
    c. distal convoluted
    d. ascending limb
    e. collecting tubule

39. Where is chloride passively transported from the tubule:
    a. Bowman's capsule
    b. proximal convoluted tubule
    c. papillary duct
    d. ascending limb
    e. collecting tubule

40. The least water concentration should be in the:
    a. capsular filtrate
    b. proximal convoluted tubule
    c. beginning of distal convoluted tubule
    d. bottom of thin loop of Henle
    e. afferent arteriole

41. Where is water actively transported:
    a. proximal convoluted
    b. descending limb
    c. ascending limb
    d. distal convoluted
    e. none of the above, since it can only by passively transported

42. The medullary fluid, in its lower region, is not diluted by water diffusing out of the descending limb nor collecting ducts, because:
    a. it diffuses into the ascending limb
    b. it enters the collecting tube
    c. the vasa recta carries it away
    d. it follows sodium up into the cortex

e. of increased ADH secretion

43. The hyper-osmotic situation in the lower medullary area, the bottom of the vasa recta, and the bottom of Henle's loop, are necessary to:
   a. produce a correspondingly hyper-osmotic urine, since progressive concentration is not possible
   b. produce a hypo-osmotic urine
   c. produce an iso-smotic urine
   d. keep the blood pressure higher in the glomerulus
   e. permit water to diffuse into the collecting duct

44. Which of the following is not hyper-osmotic:
   a. deep medullary tissue fluid
   b. distal convoluted tubule
   c. hairpin turn of the loop of Henle
   d. hairpin turn of the vasa recta
   e. urine

45. The reason for the counter current mechanism:
   a. sodium can only be passively transported
   b. there are far fewer juxtamedullary nephrons than cortical nephrons
   c. there is very little tolerance of a change in the pH of body fluids by more than a few tenths of a pH unit
   d. to be able to produce a hyper-osmotic urine, since progressive concentration is not possible
   e. unknown

46. Why does the filtrate become progressively hypo-osmotic as it ascends towards the distal convoluted tubule:
   a. water diffuses in
   b. chloride and sodium are transported out and the walls are impermeable to water
   c. the surrounding medullary fluid is hyper-osmotic
   d. it started this way in the bottom of the loop of Henle and is simply being continuously multiplied in this same direction
   e. there is no universally accepted explanation

47. Which of the following is mostly responsible for initiating the high osmotic gradients within the lower medulla, vasa recta, loop of Henle and collecting ducts:
   a. descending thick and thin segments
   b. lower collecting ducts
   c. ascending thin and thick segments
   d. descending vasa recta
   e. distal convoluted tubule

48. The high osmotic pressure in the lower medullary areas is maintained, despite continual water diffusion from the descending thick/thin portions and the collecting duct, because:
   a. the vasa recta carries away this excess water
   b. ADH prevents water reabsorption
   c. of high permeability of the peritubular capillaries
   d. active transport of chloride/sodium occurs out of the ascending thin/thick portions
   e. none of the above, since it is actually hypo-osmotic

49. A dilute urine is produced by:
    a. counter-current mechanism alone
    b. counter-current mechanism with decreased ADH secretion
    c. counter-current mechanism with increased ADH secretion
    d. active water transport into the collecting ducts
    e. none of the above, since it is always hyper-osmotic