HOMEOSTASIS TOPIC REVIEW
FROM WACE STUDY GUIDE

Terminology

These are some of the terms from this section which you should know. Write the meaning of each term in the space provided.

(i) behaviour

(ii) concentration

(iii) dynamic

(iv) effector

(v) excretion

(vi) feedback loop

(vii) homeostasis

(viii) hormone

(ix) lipolysis

(x) metabolism

(xi) nephron

(xii) optimum

(xiii) physiology

(xiv) receptor

(xv) response

(xvi) steady state system

(xvii) stimulus

(xviii) tolerance limit

Review Questions

1. The two body systems that regulate homeostasis are _____ and _____ .

2. Why is homeostasis important?

3. List some aspects of the body's internal environment that are kept at relatively constant levels.

4. What does a steady state control (feedback) system do?

5. List and describe the parts of a steady state system (feedback loop).

6. Distinguish between positive and negative feedback.

7. (a) What does the term **metabolic rate** mean?

(b) List some factors that affect metabolic rate.

(c) Explain why an increased metabolic rate results in an increased body temperature.

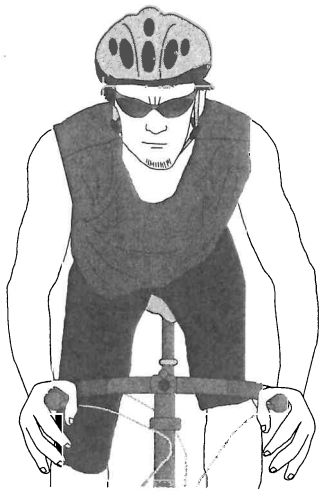
8. What part of the brain controls body temperature?

_____

9. Fill in the table below listing ways in which our bodies gain and lose heat.

Mechanisms to Produce or Retain Heat	Mechanisms to Lose Heat

10. (a) As we exercise we often sweat profusely. How does sweating aid in cooling the body?



_____

_____

_____

_____

_____

(b) Why is sweating ineffective on humid days but quite effective on dry days?

_____

_____

_____

(c) Why should new born babies be dried and wrapped up?

_____

_____

_____

11. Describe each of the following and explain how they contribute to heat loss from the body.

(a) radiation

_____

_____

_____

(b) conduction

(c) convection

12. Distinguish between **vasodilation** and **vasoconstriction.** What colour does the skin go in each case?

13. What is shivering? How does shivering raise the body temperature?

14. (a) Which two hormones control the level of sugar in the blood?

(i)

_____

(ii)

_____

(b) List the effects of each:

(i)

_____

(ii)

_____

15. How do the following two organs contribute to the maintenance of blood sugar levels?

Liver

_____

_____

Pancreas

_____

_____

16. Distinguish between:

(a) glycogenesis

_____

(b) glycogenolysis

_____

(c) gluconeogenesis

_____

17. Is the level of sugar (glucose) in the blood high or low:

(a) just before a meal?

_____

(b) very early in the morning before breakfast?

_____

18. Draw two feedback loops to show how the level of glucose in the blood is maintained in the body by insulin and glucagon:

(a) when the glucose level is high.

(b) when the glucose level is low.

19. Anorexia nervosa and bulimia nervosa are two serious mental health conditions.

(a) One effect of these is that the glucose level in the body is lowered. Suggest why.

_____

_____

_____

(b) Excessive use of laxatives in these conditions causes scarring of the lining of the small and large intestines. What effect would this have on the body?

_____

_____

_____

20. Distinguish between:

(a) plasma and lymph

_____

_____

_____

(b) intracellular fluid and extracellular fluid

21. What are three kinds of extracellular fluid?

_____, _____, _____

22. What is urine? What substances does it normally contain?

23. How does plasma compare to urine?

24. (a) Define osmotic pressure.

(b) What could cause the concentration of water to increase in the blood? (i.e. osmotic pressure decreases)

(c) What could cause the concentration of water to decrease in the blood? (i.e. osmotic pressure increases)

25. What are diuretics? Name two common examples.

26. (a) How much filtrate is produced each day by a person?

(b) How much urine is produced each day by a person?

_____

(c) So what happens to all that filtrate?

_____

_____

_____

27. Even if we do not drink very much we still produce some urine. Where does the water come from?

_____

_____

28. What is urea? Where is it produced? Why do we have to excrete it?

_____

_____

_____

29. If a person loses a lot of fluid through sweating this may concentrate tissue fluid and blood.

(a) What part of the brain is sensitive to water concentration in the blood?

_____

(b) If the water levels have dropped in the blood what sensation do you feel? (i.e. osmotic pressure is higher than normal)

_____

(c) What homeostatic mechanisms are used in an effort to restore the correct amount of water in the blood?

_____

_____

30. List the metabolic wastes that the body produces and next to each write down the name of the organ(s) that excretes it.

Metabolic Wastes	Excretory Organ

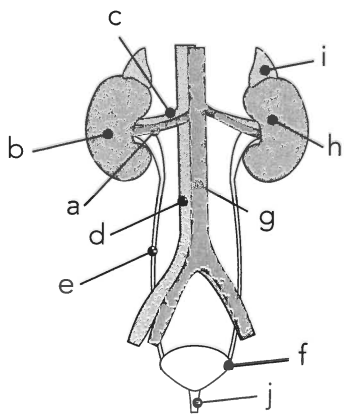
31. Describe the functions of the kidneys.

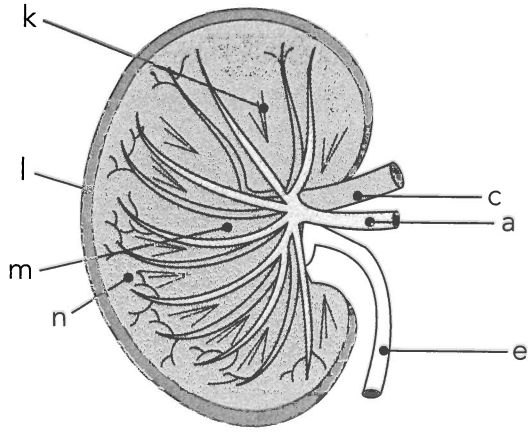
_____

_____

_____

32. (a) Label these diagrams.





a) _____ h) _____

b) _____ i) _____

c) _____ j) _____

d) _____ k) _____

e) _____ l) _____

f) _____ m) _____

g) _____ n) _____

(b) What substance is not normally found in e) but can be found in both a) and c)?

_____

(c) What substance would you find in c) and e) but in much lesser quantities in a)?

_____

(d) What substance is stored in f)?

_____

(e) What changes would there be to the contents of f) if you drank lots of tea on a cold day?

_____

_____

33. In the space below, draw and label a diagram of a nephron.

34. List in order the structures that materials filtered from the blood will flow through in the nephron.

35. (a) Define filtration.

(b) What materials are filtered from the glomerulus into the Bowman's capsule?

(c) What substances are not filtered into the Bowman's capsule?

(d) List three reasons why the filtration from the glomerulus to the Bowman's capsule occurs.

(i)

(ii)

(iii)

36. (a) What is **selective reabsorption**?

(b) What materials are reabsorbed back into the blood?

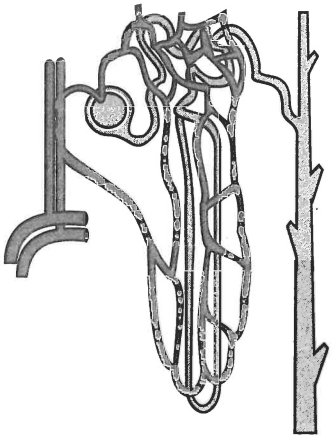
(c) Where does this reabsorption take place?

37. (a) What is **tubular secretion**?

(b) What substances are secreted into the nephron?

(c) In what part of the nephron are most substances secreted?

(d) What are two effects of tubular secretion?



38. Draw two flow diagrams in the space provided: one to show the effect of antidiuretic hormone (ADH) on increased water levels in the blood and one to show the effect of antidiuretic hormone (ADH) on reduced water levels in the blood.

39. Kidney failure which can result from damage due to infection, kidney stones, drug abuse (analgesics, etc.) or genetic disorders, means that the body is unable to remove toxic cell wastes or metabolic by-products (e.g. urea) from the blood. This can be remedied by dialysis and/or kidney transplants.

(a) What is meant by **dialysis**?

(b) How does a kidney machine work?

(c) What problems are involved with kidney transplants?

40. Complete the table below, which reviews receptors for maintaining gas concentrations and blood pressure.

Receptor site	Where found	Function
Aortic body		
Carotid body		

41. What are the effects of **adrenalin**?

42. Emphysema is a lung disease in which the alveoli are affected. Its main symptom is shortness of breath or breathlessness and this gets progressively worse. Another symptom is hardening of the lung tissue (known as fibrosis or scar tissue). The destruction of the lung tissue also causes blood to flow slower through the lungs.

(a) What happens to the alveoli?

(b) Explain how the symptoms could be related to what has happened to the alveoli.

(c) What is one way you could prevent this disease from developing?