**QUESTION – BIOLOGY**

**FORM -2**

**TRANSPORT IN PLANTS**

1. In an experiment, a leafy shoot was set up in a photometer and kept in a dark room for 2 hours. The set up was then transferred to a well-lit room for 2 hours.

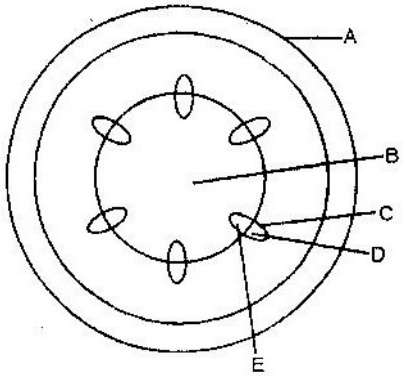
a) What was the aim of this experiment? (1mk)

b) Explain the results which would be expected in each of the two experiments conditions. (3mks)

2. Explain how drooping of leaves on a hot sunny day is advantageous to plant. (2mks)

3. Explain how environmental factors affect the rate of transpiration in flowering plants. (20mks)

4. The diagram below represents a transverse section of a young stem.




a) Name the parts labeled A and B (2mks)

A_____

B_____

b) State the functions of the parts labeled C, D and E

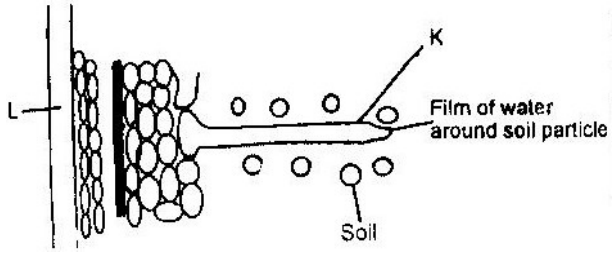
C_____

D_____

E_____

c) List three differences between the section shown above and one that would be obtained from the root of the same plant (3mks)

5. The diagram below represents the pathway of water from soil into the plant.




a) Name the structures labeled K and L

K_____

L_____ (2mks)

b) Explain how water from the soil reaches the structure labeled L.

(5mks)

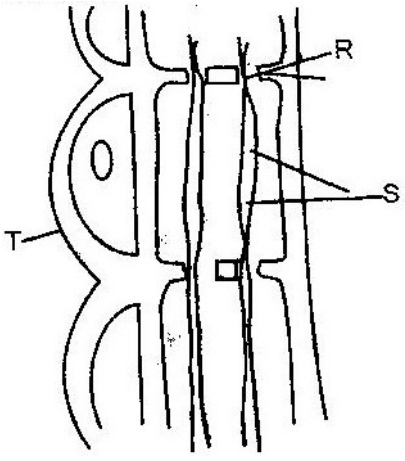
c) Name the process by which mineral salts enter into the plant.

(1mk)

6. State two ways in which xylem are adapted to their function. (2mks)

7. What makes young herbaceous plant remain upright? (2mks)

8. The diagram below represents part of phloem tissue




a) Name the structures labeled R and S and a cell labeled T.

R _____

S _____

Cell T _____ (3mks)

b) State the function of the structure labeled S. (1mk)

c) Explain why xylem is a mechanical tissue (2mks)

9. Name the

a) Material that strengthens xylem tissue. (1mk)

b) Tissue that is removed when the bark of a dicotyledonous plant is ringed.

(1mk)

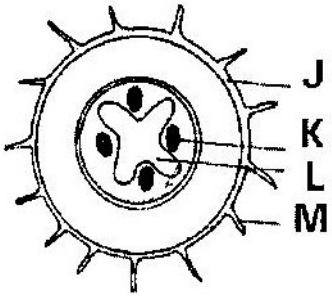
10. How are xylem vessels adapted for support? (1mk)

11. What is the role of vascular bundles in plant nutrition? (3mks)

12. a) Name two tissues which are thickened with lignin. (2mks)

b) How is support attained in herbaceous plant? (1mk)

13. The diagram below represents a transverse section through a plant organ.




a) From which plant organ was the section obtained? (1mk)

b) Give two reasons for your answer in (a) above. (2mks)

c) Name the parts labeled J, K and L (3mks)

J_____

K_____

L_____

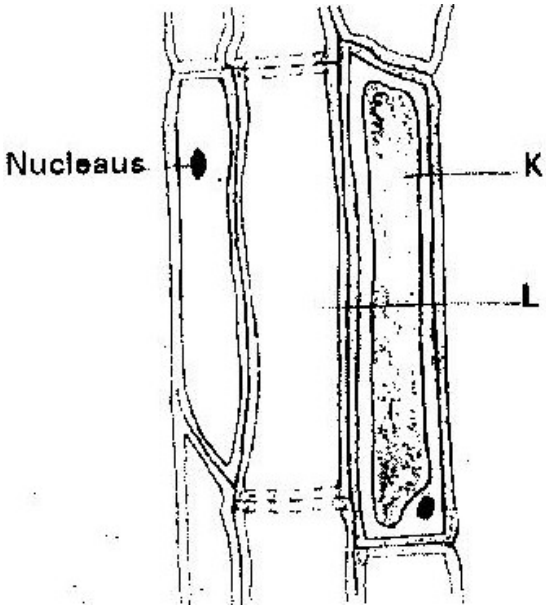
d) State two functions of the part labeled M. (2mks)

14. Describe how water moves from the soil to the leaves in a tree. (20mks)

15. State two ways in which the root hairs are adapted to their function.

(2mks)

16. The diagram below represents a plant tissue. Name the part labeled




17. In an experiment to determine the effect of ringing on the concentration of sugar in phloem, a ring of bark from the stem of a tree was cut and removed. The amount of sugar in grammes per $16cm^3$ piece of bark above the ring was measured over a 24 hour period. Sugar was also measure in the bark of a similar stem of a tree which was not ringed. The results are shown in the table below

| Time of the day | Among of sugar in grammes per 16 $cm^3$ piece of bark | |
|---|---|---|
| | Normal stem | Ringed stem |
| 06 45 | 0.78 | 0.78 |
| 09 45 | 0.80 | 0.91 |
| 12 45 | 0.81 | 1.01 |
| 15 45 | 0.80 | 1.04 |
| 18 45 | 0.77 | 1.00 |
| 21 45 | 0.73 | 0.95 |
| 00 45 | 0.65 | 0.88 |

.

a) Using the same axes, plot a graph of the amount of sugar against time

(6mks)

b) At what time was the amount of sugar highest in the;

i) Ringed stem (1mk)

ii) Normal stem (1mk)

c) How much sugar would be in the rigged stem if it was measured at 03 45 hours.

(2mks)

d) Give reasons why there was sugar in the stems of both trees at 06 45 hours.

(2mks)

e) Account for the shape of the graph for the tree with ringed stem between:

i) 06 45 hours and 15 45 hours (3mks)

ii) 15 45 hours and 00 45 hours (2mks)

f) Other than sugars name two compounds that are translocated in phloem.

(2mks)

18. Explain why plants shed off their leaves. (2mks)

19. a) What is the importance of transpiration to plants?

b) Give adaptive features which enable a plant to reduce the loss of water

**TRANSPORT IN ANIMALS**

1. People can die when they inhale gases from burning charcoal in poorly ventilated rooms. What compound is formed in the human body that leads to such deaths? (1mk)

2. Explain why blood from a donor whose blood group is A cannot be transfused into a recipient whose blood group is B. (2mks)

3. State one difference between closed and open circulatory systems. (1mk)

4. a) Give an example of a phylum where all members have

   i) Open circulatory system

   ii) Closed circulatory system (2mks)

   b) What are the advantages of the closed circulatory system over the open circulatory system? (5mks)

5. Explain two ways in which mammalian erythrocytes (red blood cells) are adapted to their function (2mks)

6. a) i) Name the blood vessels that link arterioles with venules. (1mk)

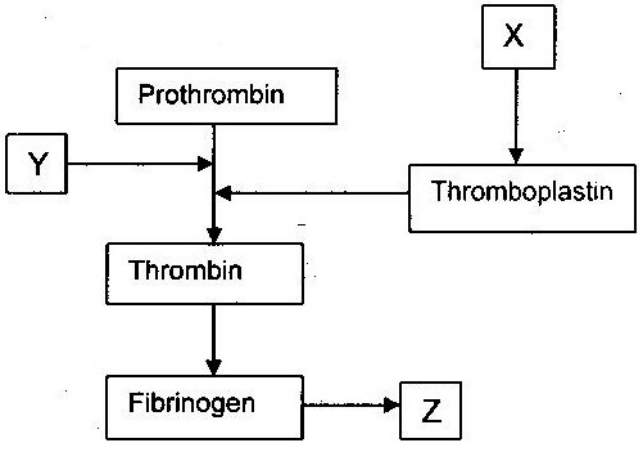
   ii) Explain four ways in which the vessels you named in (a) above are suited to carrying out their functions. (4mks)

   b) State two ways in which the composition of blood in the pulmonary arterioles differ from that in the pulmonary venules. (2mks)

7. Why would carboxyhaemoglobin lead to death? (2mks)

8. Explain how the red blood cells of mammals are adapted for efficient transport of oxygen. (2mks)

9. The chart below is a summary of the blood clotting mechanism in man.




Name

i) The blood cells represented by X

ii) Metal ion represented by Y

iii) The end product of the mechanism represented Z

10. a) How can excess bleeding result in death? (2mks)

b) Name the process by which the human body naturally stops bleeding. (1mk)

c) How can low blood volume be brought back to normal? (2mks)

11. a) Name one defect of the circulatory system in humans. (1mk)

b) State three functions of blood other than transport. (3mks)

12. a) What prevents blood in veins from flowing backwards? (1mk)

b) State two ways in which the red blood cells are adapted to their function. (2mks)

1. State one way by which HIV/AIDS is transmitted from mother to child.

(1mk)

14. Explain how the various components of blood are adapted for their function.

(20mks)

15. Distinguish between blood, plasma, serum, tissue fluid and lymph.

(10mks)

16. a) A patient whose blood group is A died shortly after receiving blood from a person of blood group B. Explain the possible cause of death of the patient. (2mks)

b) A person of blood group AB requires a transfusion.

i) Name the blood groups of the possible donors (2mks)

ii) Give reasons for your answer in (i) above. (2mks)

17. Differentiate between active immunity and passive immunity. (2mks)

18. Explain why a person can catch a cold several times in a year but only catches measles once in his or her lifetime. (2mks)

19. Most carbon dioxide is transported from tissues to the lungs within the red blood cells and not in the blood plasma. Give two advantages of this mode of transport.

(2mks)

20. What is the importance of tissue fluid? (2mks)

**GASEOUS EXCHANGE**

1. Discuss how gaseous exchange occurs in

   a) Terrestrial Insects (9mks)

   b) Bony fish (11mks)

2. a) Explain how mammalian lungs are adapted for gaseous exchange. (8mks)

   b) Describe how carbon dioxide is produced by

      i) Respiring muscle cells reaches the alveolar cavities in mammalian lungs.

      ii) Respiring mesophyll cells of flowering plants reaches the atmosphere. (12 mks)

3. a) Describe the path taken by carbon dioxide released from the tissues of an insect to the atmosphere.

   b) Name two structures used for gaseous exchange in plants. (2mks)

4. Why are gills in fish highly vascularized? (1mk)

5. Describe the

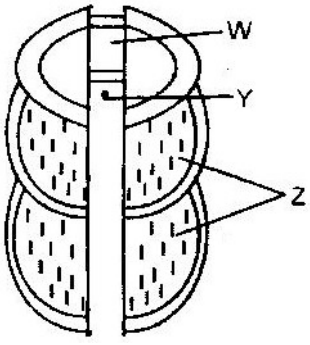
   a) Process of inhalation in mammals. (10 mks)

   b) Mechanism of opening and closing of stomata (10 mks)

2. Name three sites where gaseous exchange takes place in terrestrial plants. (3mks)

7. How is aerenchyma tissue adapted to its function? (2mks)

8. The diagram below represents a part of the rib cage.




a) Name parts labeled W, Y and Z.

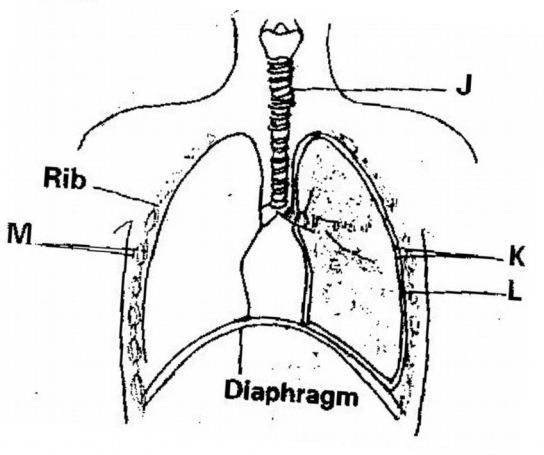
b) How does the part labeled Z facilitates breathing in? (1mk)

9. State two ways in which floating leaves of aquatic plants are adapted to gaseous exchange. (2mks)

10. a) Name two structures for gaseous exchange in aquatic plants. (2mks)

b) What is the effect of contraction of the diaphragm muscles during breathing in mammals? (3mks)

11. The diagram below represents some gaseous exchange structures in humans.




a) Name the structure labeled K, L and M (3mks)

b) How is the structure labeled J suited to its functions? (3mks)

c) Name the process by which inhaled air moves from the structure

labeled L into blood capillaries. (1mk)

d) Give the scientific name of the organism that causes tuberculosis in humans. (1mk)

12 State three factors that make alveolus adapted to its function. (3mks)

13. Explain how the alveoli are ventilated.

14. Explain why water logging of the soil may lead to death in plants. (2mks)

15. Write three advantages of breathing through nose than through mouth. (3mks)

16. State and explain ways the leaves are adapted for gaseous exchange (4mks)

17. Name three gaseous constituents involved in gaseous exchange in plants. (3mks)

18. Name three sites of gaseous exchange in frogs. (3mks)

19. Name the main site of gaseous exchange in

a) Mammals

b) Fish

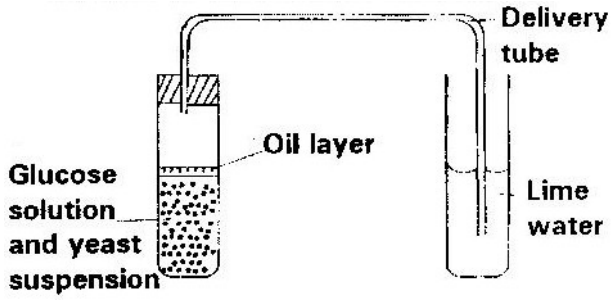
c) Leaves

d) Amoeba (4mks)

20. Name the physiological process by which gas exchange takes place at the respiratory surface in animals and plants (1mk)

**RESPIRATION**

1. The diagram below shows a set up that was used to demonstrate fermentation.




Glucose solution was boiled and oil added on top of it. The glucose solution was then allowed to cool before adding the yeast suspension.

a) Why was the glucose solution boiled before adding the yeast suspension? (1mk)

b) What was the importance of cooling the glucose solution before adding the yeast suspension? (1mk)

c) What was the use of the oil in the experiment? (1mk)

d) What observation would be made in test tube B at the end of the experiment (1mk)

e) Suggest a control for this experiment (1mk)

2. Give two reasons why accumulation of lactic acid during vigorous exercise lead to an increase in heart beat. (2mks)

3. A process that occurs in plants is represented by the equation below.

$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH) + (2CO_2) + Energy$

Glucose Ethanol Carbon Dioxide

a) Name the process (1mk)

b) State the economic importance of process name in (a) above.

(1mk)

4. Other than carbon dioxide, name the other products of anaerobic respiration in plants. (2mks)

5. Name the substance which accumulates in muscles when respiration occurs with insufficient oxygen. (1mk)

6. a) In what form is energy stored in muscles? (1mk)

b) State the economic importance of anaerobic respiration in plants.

(2mks)

7. State four ways in which respiratory surfaces are suited to their function.

(4mks)

8. a) A dog weighing 15.2kg requires 216kJ while a mouse weighing 50g requires 2736KJ per day. Explain. (2mks)

b) What is the end product of respiration in animals when there is insufficient oxygen supply? (1mk)

9 a) Name the products of anaerobic respiration in:

i) Plants (1mk)

ii) Animals (1mk)

b) What is oxygen debt? (1mk)

10. $5C_{51}H_{98}O_{6+}\ 145O_2 \longrightarrow 1\ O_2CO_2 + 98\ H_2O$ + energy

The above equation shows an oxidation reaction of food substances.

a) What do you understand by the term respiratory quotient? (1mk)

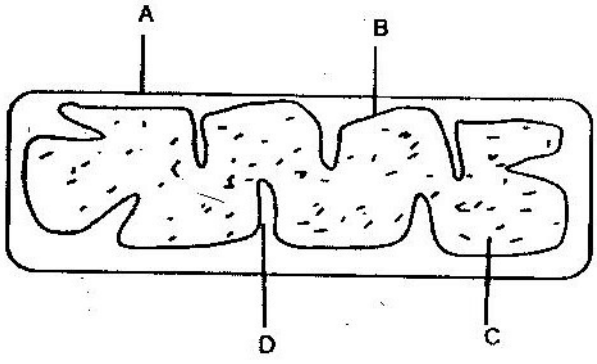
b) Determine respiratory quotient of the oxidation of food substance.

(2mks)

c) Identify the food substances. (1mk)

11 Write differences between aerobic respiration and photosynthesis. (4mks)

12. Below is a diagram of an organelle that is involved in aerobic respiration.




a) Name the organelle (1mk)

b) Name the parts labeled A, B, and C. (3mks)

c) What is the purpose of the folding labeled D? (1mk)

d) Give the chemical compound which is formed in the organelle and forms the immediate source of energy.

**EXCRETION AND HOMEOSTASIS**

3. In an investigation the pancreatic duct of a mammal was blocked. It was found that the blood sugar regulation remained normal while food digestion was impaired. Explain these observations. ( 2 marks)
4. (a) Explain why the body temperature of a healthy human being must rise up to $39^0$c on a humid day. (2 marks)

   (b) In an experiment a piece of brain was removed from rat. It was found that the rat had large fluctuations of body temperatures suggest the part of the brain that had been removed. ( 1 mark)
5. (a) Explain why sweat accumulates on a person's skin in a hot humid Environment. (2 marks)

   (b) Name the specific part of the brain that triggers sweating. ( 1 marks)
6. Explain why some desert animals excrete uric acid rather than ammonia. (2 marks)
7. State the role of the following hormones in the body
   a. Insulin (3 marks)
   b. Antidiuretic Hormone (3 marks)
8. What osmoregulatory changes would take place in a marine amoeba if it was transferred to a fresh water environment?
9. Name two components of blood that are not present in glomerular filtrate.
10. How would one find out from a sample of urine whether a person is suffering from diabetes mellitus? (2 marks)

11. When is glycogen, which is stored in the liver, converted into glucose and released into the blood? ( 2 marks)

12. A person was found to pass out large volumes of dilute urine frequently. Name the

(a) Diseases the person was suffering from (1 marks)

(b) Hormone that was deficient (1 mark)

13. State the importance of osmoregulation in organisms ( 2 marks)

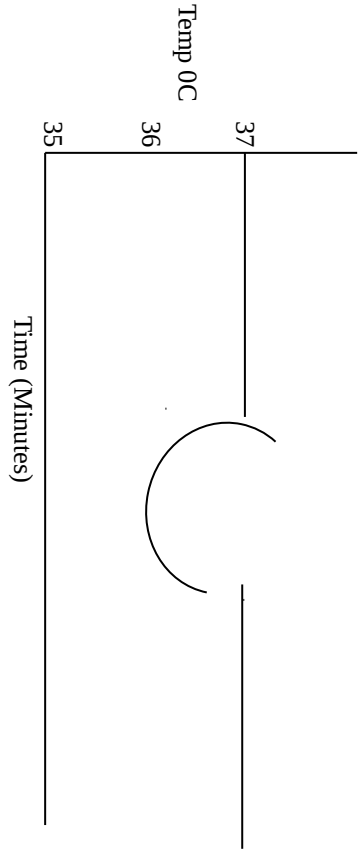
14. What happens to excess fatty acids and glycerol in the body? (2 marks)

15. Give reasons for each of the following

(a) Constant body temperature is maintained in mammals ( 1 mark)

(b) Low blood sugar level is harmful to the body ( 2 marks)

16. The temperature of a person taken before during and after taking a cold bath. The results are shown in the graph



(a) Explain why the temperature fell during the bath ( 2 marks)

(b) What changes appeared in the skin that enabled the body temperature to return to normal. (2 marks)

17. (a) Name the fluid that is produced by sebaceous glands (1 mark)

(b) What is the role of sweat on the human skin? ( 2 marks)

18. State the role of insulin in the human body? ( 1 mark)

19. Describe how the human kidney functions. ( 20 marks)

20. (a) What is the meaning of the following terms:

(i) Homeostasis ( 1 mark)

(ii) Osmoregulation ( 1 mark)

21. (a) Explain what happens to excess amino acids in the liver of humans.

( 3 marks)

- Which portions of the human nephrons are only found in the cortex?

( 3 marks)

- (i) What would happen if a person produced less antidiuretic hormone?

( 1 mark)

(ii) What term is given to the condition described in (c) (i) above?

( 1 mark)

22. Define the following terms

a. Excretion

b. Secretion

c. Egestion ( 3 marks)

23. Name the components of blood that do not enter the renal tubule in mammals

(2 marks)

24. The table below shows the approximate percent concentration of various components in blood plasma entering the kidney glomerular filtrate and urine of a healthy human being.

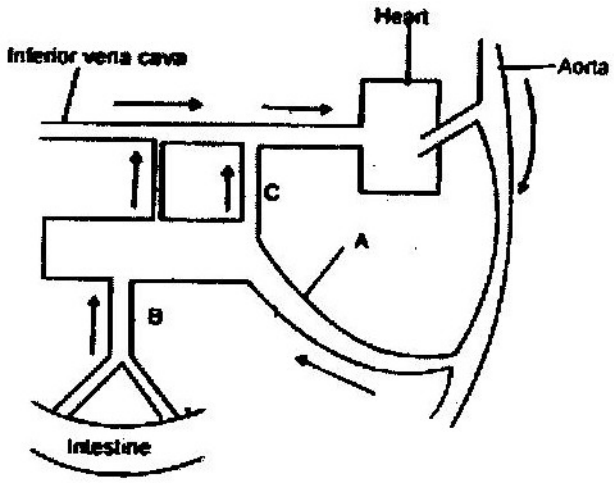
| Component | Plasma | Glomerular | Urine Filtrate |
|---|---|---|---|
| Water | 90 | 90 | 94 |
| Glucose | 0.1 | 0.1 | 0 |
| Amino Acids | 0.05 | 0.05 | 0 |
| Plasma proteins | 8.0 | 0 | 0 |
| Urea | 0.03 | 0.03 | 2.0 |
| In organic ions | 0.72 | 0.72 | 1.5 |

- Name the process responsible for the formation of glomerular filtrate.
- What process is responsible for the absence of glucose and amino acids in urine?
- Explain why there are no plasma proteins in the glomerular filtrate
- Besides plasma proteins what other major component of blood is absent in the glomerular filtrate.
- Why is the concentration of urea in urine much higher than its concentration in the glomerular filtrate?

25. When the environmental temperature is very high, some animals urinate on their legs or lick the sides of their body. How does this help in temperature regulation?
26. Fish are able to use more of their food intake for growth than mammals. Suggest an explanation for this.

27. Explain the term negative feedback

28. Study the diagram below and answer the questions that follow.




(a) Name the blood vessels labeled A, B and C.

(b) If the animals has recently fed on a diet which is rich in proteins and carbohydrates in which of the vessels labeled A, B, and C would you expect to find the highest concentration of:

(i) Glucose

(ii) Amino acids

(iii) Carbon (IV) oxide

(iv) Oxygen

(v) Urea

(c) During fasting, the level of blood glucose in vessels C may be higher than the level in vessel B explain

## The blood circulatory system

**1** How do white cells differ from red cells
(a) in their structure,
(b) their function?

**2** Where are blood cells made in the body?

**3** Name two proteins carried in the plasma.

**4** What else is carried in the plasma?

**5** Put the following events in their correct order starting with the first one listed:
*atria fill with blood, semi-lunar valves close, tricuspid and bicuspid valves close, ventricles contract, semi-lunar valves open, atria contract, ventricles relax, tricuspid and bicuspid valves open*

**6** Fill in the missing words.
Oxygenated blood from the lungs returns to the …(A)…. atrium of the heart in the …(B)…. vein. From here it enters the …(C)…. ventricle and leaves the heart in the …(D)…. to go to the body.
From the body……(E)…blood returns via the …(F)….to the …(G)…. atrium, and then leaves the heart in the …(H)…… artery to go to the …(I)….

**7** Which one of the following is not a characteristic of capillary blood vessels?
(a) Repeatedly branched.
(b) Small diameter.
(c) Permeable to salts (ions)
(d) Thick walled.

**8** Arteries carry blood …… the heart. Veins carry blood ……the heart.

**9** In which parts of the circulatory system are there valves?

**10** What is the connection between tissue fluid, plasma and lymph?

**11** How is lymph propelled through the lymphatics?

**12** What is the function of lymph nodes?

**13** Complete the table.

| Substance | Transported by the blood | |
|---|---|---|
| | *From* | *To* |
| Oxygen | (A) | whole body |
| (B) | whole body | lungs |
| (C) | liver | kidneys |
| (D) | intestine | (E) |
| Heat | (F) | (G) |

**14** After a period of vigorous activity you would expect blood leaving a muscle to have
(a) less carbon dioxide, less oxygen and less glucose
(b) more carbon dioxide, more oxygen and less glucose
(c) more carbon dioxide, more oxygen and more glucose
(d) more carbon dioxide, less oxygen and less glucose.

**15** Blood from the alimentary canal returns to the heart by way of
(a) hepatic vein and vena cava
(b) hepatic artery, hepatic vein and vena cava
(c) hepatic portal vein and vena cava
(d) hepatic portal vein, hepatic vein and vena cava.

**16** Describe briefly how platelets, fibrin and red cells interact to form a blood clot.

**17** Briefly describe the principal lines of defence against bacteria entering the blood system.

**18** The substances produced by lymphocytes to combat bacterial cells are called
(a) antigens,
(b) antibodies,
(c) antidotes,
(d) antitoxins.

**19** You may acquire natural, active immunity to a disease if
(a) you are injected with an antibody to the disease
(b) you recover from an attack of the disease
(c) you are inoculated, against the disease
(d) you are born with antibodies to the disease?

**20** In each case, give an example of a disease to which immunity can be acquired by injecting
(a) an inactivated bacterial toxin
(b) a killed bacterium
(c) an antibody.

**21** A person: whose blood group is AB can receive a blood transfusion from
(a) group O only
(b) group AB only
(c) groups A and B
(d) any group.

**22** Apart from any inherited tendency towards coronary heart disease, what are thought to be the four main risk factors?

## Breathing

**1** (a) Energy is obtained from food by a process called ..…(A)…..
(b) The intake of oxygen and output of carbon dioxide at a respiratory surface is called …..(B)…..
(c) The process of renewing air in the lungs is called ..…(C)…..
(d) Which of the processes A-C are included in the term 'breathing'?

**2** Name, in the correct order, the structures that incoming air would pass through between the nasal cavity and the alveolus.

**3** What is the function of the rings of cartilage in the respiratory passages?

**4** Using the words 'cilia' and 'mucus', describe, very briefly, how the body gets rid of dust which enters the lungs.

**5** Which of the following is correct:
When we inhale
(a) our intercostal muscles contract and our ribs move down
(b) our diaphragm muscles contract and the ribs move up
(c) our diaphragm muscles contract and the ribs move down
(d) our intercostal muscles contract and the diaphragm muscles relax.

**6** In what two ways will the composition of blood coming from the pulmonary artery differ from that going to the pulmonary vein?



**7** The percentage of oxygen absorbed from the air in the lungs is always about the same, so how can the oxygen supply to the blood be increased during vigorous activity?

**8** Inhaled air contains about 21 % oxygen. What is the approximate percentage concentration of oxygen in exhaled air?

**9** Which of the terms (i) vital capacity, (ii) tidal volume, (iii) residual air, could reasonably apply to each of the volumes given below?
(a) 500 $cm^3$, (b) 5000 $cm^3$, (c) 1000 $cm^3$.

**10** State four characteristics of an efficient respiratory surface.

**11** What process causes oxygen to pass from the alveoli into the lung capillaries?

**12** Which of the following diseases are unlikely to be caused by smoking: (a) lung cancer, (b) tuberculosis, (c) bronchitis, (d) colds, (e) heart attacks?

## Digestion

**1** Which one of the following structures is not part of the alimentary canal?
(a) duodenum (c) liver
(b) mouth (d) stomach:

**2** Name two digestive glands.

**3** What name is given to the muscular contraction which moves food along the alimentary canal?

**4** What do digestive enzymes do to food?

**5** What are the final digestion products of (a) protein, (b) fat, (c) starch?

**6** How does chewing food help to speed up digestion?

**7** Name the enzyme present in saliva and say what type of food it acts on.

**8** Are the contents of the stomach (a) acid, (b) alkaline,{c) neutral?

**9** What class of food is partially digested in the stomach?

**10** What is the name of the enzyme in gastric juice?

**11** What types of enzymes are produced by the pancreas?

**12** Into which part of the alimentary canal does the pancreas secrete pancreatic juice?

**13** What is the function of bile in digestion?

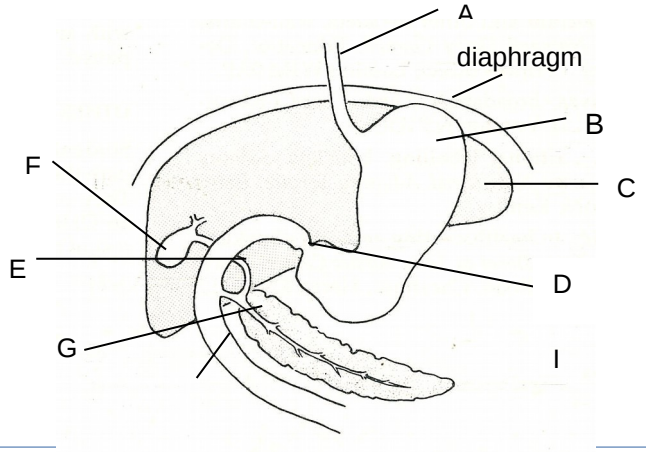
**14** State three ways in which the absorbing surface of the small intestine is increased.

**15** Into what body fluids do (a) glucose, (b) fatty acids, glycerol (c) amino acids pass?

**16** Fill in the missing words..
The blood from the intestine goes first to the …….. before entering the general circulation. If the glucose concentration in the blood is above a certain level, it is changed to …….. and stored. Glucose which passes into the general circulation is taken up by the body cells and used to provide ……..
If there are excess amino acids in the blood from the intestine, the liver converts them to …….. which is stored, and …….. which is excreted by the kidneys..

**17** What does the liver do to (a) hormones, (b) alcohol, (c) vitamin A?

**18** Name the structures labelled A to I.



## Excretion and the kidneys

**1** Name four substances that have to be excreted from the body.

**2** Name three organs which have an excretory function.

**3** Supply the missing words in the following paragraph:
Blood is taken to the kidney in the …. (A)…. artery, which divides up into many arterioles. The arterioles enter the …. (B) …. of the kidney and supply thousands of glomeruli. In each glomerulus, …. (C) …. forces plasma minus its …. (D) …. out of the capillaries, and it collects in the …. (E) …. .This liquid passes down the …. (F) …. where …. (G) …. , ….(H) …. and …. (I) …. are reabsorbed into the blood. The remaining liquid, called ….. (J) ….. passes down the ….. (K) ….. and collects in the ….. (L) ….. before being expelled from the body.

**4** In hot weather the urine becomes
(a) more concentrated and lighter in colour;
(b) more concentrated and darker in colour
(c) less concentrated and lighter in colour
(d) 1ess concentrated and darker in colour.

**5** Which of the following substances would you not normally expect to find in a sample of urine?
(a) uric acid, (b) ammonia, (c) glucose, (d) sodium chloride, (e) urea.

**6** Blood in the renal vein differs from that in the renal artery by having
(a) less oxygen, more carbon dioxide and less urea
(b) more oxygen, 'more carbon dioxide and less urea
(c) less oxygen, less carbon dioxide and less urea
(d) less oxygen, more carbon dioxide and more urea,

**7** In what ways is water lost from the body?

**8** If the concentration of solutes in the blood rises above a certain level, then
(a) more water is reabsorbed in the kidney tubules
(b) less water is reabsorbed in the kidney tubules
(c) more salt is reabsorbed in the kidney tubules
(d) less glucose is reabsorbed in the kidney tubules,

**9** In a dialysis machine, which one of the following combination of substances is allowed to escape from the patient's blood into the bathing solution?
(a) Salts, water and glucose.
(b) Salts, urea and glucose.
(c) Water, urea and uric acid.
(d) Water, uric acid and glucose.

**10** State two procedures which are used to reduce the chances of a kidney graft being rejected.

**11** Make a table to show three organs which have a homeostatic function and in each case indicate two of the substances whose concentration they control.

## Food and diet 1 State three main ways in which the body uses food.

**2** Write down the words missing from the following paragraph:
Fats and carbohydrate both provide the body with ……., but fats can provide …….. as much as carbohydrates. Excess fats can be stored in the body but carbohydrates must be changed into …….. or ……. before they can be stored. The main types of carbohydrates are …….. , …… and …… Examples of foods rich in starch are …….. and ……. foods rich in fat are …….. and ……..

**3** In what form is most. carbohydrate taken in the normal diet?

**4** Write down the words omitted from the following paragraph:
Proteins are made up of about 20 different …….. One example of a plant product rich in protein is …….. . An animal product rich in protein is …….. . When a protein is digested, it is broken down into its constituent …….. and these are later built up in the body to make new …… Excess proteins which are not used for making new cells or tissues are converted to …….. which can be stored or used to provide …… .

**5** Which of the following are **not** rich in carbohydrate: bread, fish, potatoes, beans, meat, lettuce, sugar, biscuits?

**6** (a) Carbohydrates contain the elements ……. , …….. and ……
(b) Proteins contain these elements but also …….... and …….

**7** (a) Name the mineral elements needed by (i) bones, (ii) red blood cells, (iii) the thyroid gland
(b) Which of these elements is (i) present in milk, (b) lacking in milk?

**8** State one benefit of including vegetable fibre (roughage) in the diet..

**9** (a) Which vitamin helps to maintain resistance to infectious diseases?
(b) Name two foods which are a good source of this vitamin.

**10** (a) Which vitamin is necessary for the proper development of the skeleton?
(b) Name two foods which are a good source of this vitamin.

**11** A balanced diet must contain enough energy to meet the body's needs. What else must it contain?

**12** Could you survive on a diet which contained no carbohydrate?

**13** Western diets are often unhealthy because they contain too much …… and …….. and not enough …….

**14** How does refrigeration help to stop food from going bad?

15 Give one method of pasteurisation of milk.

**16** (a) Name two food additives needed to keep food wholesome, and say what they do.
(b) Name two food additives (or types of additive) which are not necessary for keeping

food wholesome.

**17** (a) Heating a food sample with Benedict's solution is a test for ……
(b) A test for starch is to add …….. solution to the food.
(c) In the biuret test for protein ……. and …….. solutions are added to the sample. A …….. colour indicates the presence of protein.

## The skin, and temperature control

**1** From the list below, select the most appropriate words or phrases to complete the following sentences.
(a) Our skin protects us against …..(A) …..and …..(B)…..
(b) Our skin helps to control ….. (C) ….. and …..(D) …..

*touch and pressure, ultraviolet light, bacteria, evaporation of water, heat from the sun, body temperature.*

**2** Name the two main layers of the skin.

**3** What are the main functions of (a) the basal (Malpighian) layer, (b) the cornified layer of the skin?

**4** Make a list of the structures you would expect to find in the dermis.

**5** What are likely to be (a) the coldest, (b) the warmest parts of the body?

**6** What, approximately, is the normal range of body temperature?

**7** List the ways in which the body might lose heat.

**8** What (a) internal, (b) external events contribute to gain of heat in the body?

**9** (a) What is 'vaso-constriction'?
(b) What are the effects of vaso-constriction in the skin?

**10** Why should shivering contribute to heat gain in the body?

**11** (a) What is meant by 'vaso-dilation'?
(b) What are the effects of vaso-dilation in the skin?

**12** Sweating, by itself, will not cool the body. What has to happen to sweat if it is to have a cooling effect?

**13** What do you understand by the term hypothermia?

**14** Name two ways in which the chances of hypothermia can be reduced during outdoor activities.