Topic 5: Food and humans

1. Which of the following are possible steps to ensure that the translucent spot on a filter paper in the spot test for oil is permanent?
   (1) shine the filter paper with a table lamp
   (2) heat the filter paper in an oven at 100°C
   (3) place the filter paper under a fan
   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

Directions: Questions 2 to 4 refer to the diagram below, which shows the composition of four foods.

![Diagram showing the composition of four foods: P, Q, R, and S.]

key: □ carbohydrates ■ proteins □ lipids ■ others

2. People suffering from kidney failure should avoid taking in too much
   A. P and Q.
   B. P and R.
   C. Q and S.
   D. R and S.

3. A student performed different food tests on food P. Which of the following results would he get?
<table>
<thead>
<tr>
<th>Iodine test</th>
<th>Grease spot test</th>
<th>Albustix paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. positive</td>
<td>positive</td>
<td>negative</td>
</tr>
<tr>
<td>B. positive</td>
<td>negative</td>
<td>positive</td>
</tr>
<tr>
<td>C. negative</td>
<td>positive</td>
<td>positive</td>
</tr>
<tr>
<td>D. negative</td>
<td>negative</td>
<td>negative</td>
</tr>
</tbody>
</table>

Directions: Questions 4 and 5 refer to the diagram below, which shows an enzymatic reaction.
4. The reaction is an example of
   A. condensation.
   B. oxidation.
   C. hydrolysis.
   D. hydrogenation.

5. Q is glucose, which of the following correctly identifies P and R?
   P
   R
   A. maltose glucose
   B. maltose fructose
   C. sucrose glucose
   D. lactose fructose

6. Which of the following food substances most readily provides energy for the body?
   A. lipids
   B. proteins.
   C. carbohydrates
   D. vitamins

7. Which of the following correctly arranges the molecules of protein, from the simplest form to the most complex form?
   (1) amino acid
   (2) globular protein
   (3) dipeptide
   (4) polypeptide
   A. (1) → (2) → (4) → (3)
   B. (1) → (3) → (4) → (2)
   C. (1) → (4) → (3) → (2)
   D. (3) → (1) → (2) → (4)

8. The table below shows the daily nutritional requirement per kg body mass of four people.

<table>
<thead>
<tr>
<th>People</th>
<th>Energy (kJ)</th>
<th>Protein (g)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>325</td>
<td>0.95</td>
<td>40.0</td>
<td>0.50</td>
</tr>
<tr>
<td>X</td>
<td>178</td>
<td>0.86</td>
<td>15.4</td>
<td>0.12</td>
</tr>
<tr>
<td>Y</td>
<td>160</td>
<td>0.84</td>
<td>18.2</td>
<td>0.33</td>
</tr>
<tr>
<td>Z</td>
<td>176</td>
<td>1.3</td>
<td>18.2</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Which person is likely to be an 8-year-old boy?
9. The sugar found in human blood is:
   A. Fructose
   B. Starch
   C. Glucose
   D. Glycogen

10. Which of the following is not a polysaccharide?
    A. Cellulose
    B. Glycerol
    C. Starch
    D. Glycogen

11. Fat is formed from the condensation of:
    A. Amino acids
    B. Amino acids and glycerol
    C. Fatty acids and glycogen
    D. Fatty acids and glycerol

12. Which of the following correctly arranges the foods in a meal, from eating most to eating least, in a balanced diet?

   (1) bread
   (2) butter
   (3) ham
   (4) corn

   A. (1), (3), (2), (4)
   B. (1), (4), (3), (2)
   C. (3), (1), (4), (2)
   D. (4), (1), (2), (3)

Directions: Questions 13-14 refer to the diagram below, which shows a food test on a sample of orange juice. In the food test, solution X changed to colourless.
13. David said that orange juice is good for people suffering from scurvy. David’s statement can be supported by the presence of which of the following substances in orange juice?
   A. vitamin C  
   B. reducing sugars  
   C. starch  
   D. proteins

14. Which of the following liquids is solution X?
   A. Benedict’s solution  
   B. DCPIP solution  
   C. alcohol  
   D. iodine solution

15. Beans are rich in which may be deficient in the diet of a vegetarian.
   A. proteins  
   B. carbohydrates  
   C. vitamins  
   D. lipids

16. Which of the following are monosaccharides?
   A. glucose, galactose and fructose  
   B. glucose, galactose and sucrose  
   C. glucose, sucrose and lactose  
   D. glucose, fructose and lactose

17. Which of the following is the fate of excess carbohydrates in the human body?
   A. It is stored as glycogen in the liver and muscles, or as lipids under the skin.  
   B. It is stored as glycogen in the liver and muscles, or as proteins under the skin.  
   C. It is stored as proteins in the liver and muscles, or as lipids under the skin.
D. It is stored as lipids in the liver and muscles, or as glycogen under the skin.

18. In humans, proteins are used for
   (1) making enzymes.
   (2) growth.
   (3) repair.
   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

19. In humans, excess amino acids taken in are
   A. stored in the body.
   B. excreted directly in urine.
   C. deaminated and excreted.
   D. egested.

20. Which of the following is not a major source of energy even under starvation?
   A. carbohydrates
   B. lipids
   C. proteins
   D. vitamins

21. Which of the following can be used to test for the presence of proteins?
   A. Benedict’s test
   B. iodine test
   C. using Clinistix paper
   D. using Albustix paper

Directions: Questions 22 and 23 refer to the food label below, which shows the nutrition facts of a certain kind of food.

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving size: 1 Package: 258 g</td>
</tr>
<tr>
<td>Servings per container: 1</td>
</tr>
<tr>
<td>Amount per serving</td>
</tr>
<tr>
<td>Energy 1134 kJ From fat 294 kJ</td>
</tr>
<tr>
<td>% Daily value</td>
</tr>
<tr>
<td>Total fat 8 g 12%</td>
</tr>
<tr>
<td>Saturated fat 3.5 g 15%</td>
</tr>
<tr>
<td>Cholesterol 30 mg 9%</td>
</tr>
<tr>
<td>Sodium 500 mg 20%</td>
</tr>
<tr>
<td>Total carbohydrate 28 mg 9%</td>
</tr>
</tbody>
</table>
Dietary fibre  3 g  13%
Sugars  5 g
Protein  21 g
Vitamin A  8%  .  Vitamin C  0%
Calcium  35%  .  Iron  6%

22. Which of the following persons should not take this food regularly?
   A. a 10-year-old boy
   B. a pregnant woman
   C. an old man with high blood pressure
   D. an old woman with osteoporosis

23. In which of the following tests will the above food give a negative result?
   A. Benedict’s test
   B. DCPIP test
   C. using Albustix paper
   D. grease spot test

24. Food tests were carried out on a food sample. The table below shows the results of the food tests.

<table>
<thead>
<tr>
<th>Food test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Albustix paper</td>
<td>Test end appeared yellow</td>
</tr>
<tr>
<td>Using Clinistix paper</td>
<td>Test end appeared purple</td>
</tr>
<tr>
<td>Iodine test</td>
<td>Iodine solution changed to blue-black</td>
</tr>
</tbody>
</table>

The food sample was most likely
   A. a steak
   B. an apple
   C. butter
   D. a fish

Directions: Questions 25-27 refer to the experiment below, which was designed to show the effect of temperature on the activity of enzyme X.

Six set-ups (each of them consisted of a pair of test tubes containing enzyme X and solution Y respectively) were put in ice and water baths of different temperatures for 10 minutes. For each set-up, enzyme X and solution Y were mixed together and a drop of each mixture was added to an iodine drop on a spot plate at 2-minute intervals.

The following table shows the results:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Colour of the mixture and the iodine drop at time zero</th>
<th>Change of the blue-black colour after 10 minutes</th>
<th>Time taken for the disappearance of blue-black colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°C</td>
<td>Blue-black</td>
<td>Unchanged</td>
<td>-</td>
</tr>
<tr>
<td>Temperature</td>
<td>Colour</td>
<td>Reaction Time</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>20°C</td>
<td>Blue-black</td>
<td>Disappeared</td>
<td>10 minutes</td>
</tr>
<tr>
<td>40°C</td>
<td>Blue-black</td>
<td>Disappeared</td>
<td>6 minutes</td>
</tr>
<tr>
<td>60°C</td>
<td>Blue-black</td>
<td>Disappeared</td>
<td>3 minutes</td>
</tr>
<tr>
<td>80°C</td>
<td>Blue-black</td>
<td>Unchanged</td>
<td>-</td>
</tr>
<tr>
<td>100°C</td>
<td>Blue-black</td>
<td>Unchanged</td>
<td>-</td>
</tr>
</tbody>
</table>

25. Enzyme X and solution Y are
   A. catalase and sucrose solution respectively
   B. protease and protein solution respectively
   C. amylase and starch solution respectively
   D. lipase and lipid solution respectively

26. The blue-black colour in three of the six set-ups disappeared because
   A. enzyme X reacts with solution Y to form a new substance
   B. enzyme X breaks down solution Y into simpler substances
   C. enzyme X is denatured by solution Y
   D. enzyme X combines with solution Y to form a complex

27. Which of the following is the best conclusion of this experiment?
   A. Enzyme X cannot work at 20°C, 40°C and 60°C
   B. Enzyme X is denatured at 0°C and temperatures above 80°C
   C. Higher temperature favours the activity of enzyme X
   D. The optimum temperature for the activity of enzyme X is 60°C

Directions: Questions 28-29 refer to the photographs below, which show different kinds of food.

28. What are the main kinds of food substances present in the above food?
   A. carbohydrates minerals proteins
   B. vitamins carbohydrates lipids
   C. lipids carbohydrates proteins
   D. proteins dietary fibre lipids

29. If the main food substances in Y and Z are in excess, they will be converted into
   A. glycogen only urea only
30. Which of the following are all disaccharides?
   A. Maltose, lactose, sucrose
   B. Glucose, fructose, maltose
   C. Fructose, lactose, sucrose
   D. Glucose, maltose, sucrose

31. Different kinds of proteins differ from each other in containing
   (1) Different kinds of amino acids
   (2) Different numbers of amino acids
   (3) Different orders of amino acids

   A. (1) only
   B. (3) only
   C. (1) and (3) only
   D. (1), (2) and (3)

32. For the same mass, which of the following foodstuffs contains the greatest amount of protein?
   A. Rice
   B. Apple
   C. Carrot
   D. Soybean

Questions 33, 34, 35 refer to the table below:

<table>
<thead>
<tr>
<th>Foodstuffs</th>
<th>Composition per 100 g of foodstuffs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbohydrate (g)</td>
<td>Fat (g)</td>
</tr>
<tr>
<td>Orange</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Lettuce</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Potato</td>
<td>21</td>
<td>0.5</td>
</tr>
<tr>
<td>Soybean</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

33. Which one can be used as an immediate source of energy?
   A. Orange
   B. Lettuce
   C. Potato
   D. Soybean

34. The unit of energy value of food is
   A. Kg
   B. kJ
C. km
D. ml

35. Which foodstuff has the highest energy value?
   A. Orange
   B. Lettuce
   C. Potato
   D. Soybean

36. P, Q, and R are three kinds of foodstuffs with the following components.

<table>
<thead>
<tr>
<th>Food component</th>
<th>Starch</th>
<th>Protein</th>
<th>Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>90</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Q</td>
<td>0</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>R</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

These three kinds of foodstuff may be:
   P Queen R
   A. beef cabbage rice
   B. cabbage beef rice
   C. rice beef cabbage
   D. beef rice cabbage

37. Beans is a better source of proteins than meat for people under a slimming diet because the beans contain
   A. Less protein
   B. Less fat
   C. More vitamin C
   D. More dietary fibre

38. As a slimming method, some people avoid carbohydrates and take in lot of meats. This slimming method is ineffective because excess proteins
   A. Can be broken down to produce carbohydrates
   B. Can be stored in the body
   C. Will increase the weight of the muscle
   D. Will be converted to fat in the liver.

39. For the same mass in a diet, which of the following foodstuffs supplies the least amount of energy to a human body?
   A. Bread
   B. Lettuce
   C. Apple
   D. Beef

40. In a food test, a student found that a liquid food dropped on a filter paper left a translucent spot on the paper even
when the liquid had dried up. What further test was required to confirm that the liquid contain fat?
A. Put the paper in a desiccators  
B. Wash the spot with warm water  
C. Repeat the test with another paper  
D. Wash the spot with alcohol

41. Which of the following food test requires heating?
A. Biuret test  
B. Iodine test  
C. Emulsion test  
D. Benedict’s test

42. Proteins may contain the elements of
(1) Carbon  
(2) Hydrogen  
(3) Iodine  
(4) Nitrogen  
(5) Oxygen  
(6) Sulphur
A. (1), (2) and (5)  
B. (1), (2), (3), (4)  
C. (1), (2), (3), (4) and (5)  
D. (1), (2), (4), (5) and (6)

43. Sodium hydroxide is essential for:
A. Iodine test  
B. Benedict’s test  
C. Emulsion test  
D. Biuret test

44. A liquid contains protease, maltose and starch. Which of the following tests on the liquid would yield a negative result?
A. Benedict’s test  
B. Albustix paper test  
C. Iodine solution test  
D. Emulsion test

45. A leaf was crushed and the extract was boiled with Benedict’s solution. A red precipitate was produced in the solution. With this result, it can be concluded that the leaf contained
A. Sucrose and glucose  
B. Glucose and fructose
C. Glucose and starch
D. Reducing sugars

46. A person performed an experiment to estimate the concentration of vitamin C (ascorbic acid) in lemon juice. He obtained the following two results.
(1) 10 drops of the juice decolorized 4mL of a DCPIP solution
(2) 20 drops of a 0.1% ascorbic acid solution decolorized 2mL of the same DCPIP solution

The concentration of vitamin C in the lemon juice is
A. 0.05%
B. 0.1%
C. 0.2%
D. 0.4%

47. Glycogen can be stored in
(1) Liver
(2) Muscles
(3) Pancreas

A. (1) and (2) only
B. (2) and (3) only
C. (1) and (3) only
D. (1), (2) and (3)

Three test tubes were prepared as shown in the diagram. After about half an hour, some Benedict’s solution was added to each test tube and all the test tubes were heated in a water bath.

48. In which tubes will precipitate observed? (Hint: sucrase can break down sucrose into simpler units)
A. I only
B. I and II only
C. I and III only
D. I, II and III

Directions: question 49 and 50 below refer to the diagram, which shows a method used to estimate the energy value of food.
49. On burning 4 g of starch, the temperature of the water rose from 25°C to 40°C.  
The experiment was repeated with 2.0 g of food X. The temperature of the water rose from 25°C to 42°C.  
Food X is most probably be:  
A. Cane sugar  
B. Bread  
C. Soybean  
D. Peanut oil

50. Which of the following factors would not affect the accuracy of the results in this experiment?  
A. Heat was lost from the burning food to the surrounding  
B. The masses of starch and food X were different  
C. The food might not be completely burnt  
D. The food had been set to burning before heating the water

Directions: The diagram below shows two beakers containing two kinds of liquids. Answer the questions 51 and 52 by referring to the diagram.

51. The liquid in beaker A is added to beaker B. Which of the following is the correct results when the mixture is immediately tested separately with the food tests indicated below.  
Key: -ve negative result  
+ve positive result

<table>
<thead>
<tr>
<th>Benedict’s test</th>
<th>Albustix paper test</th>
<th>Iodine test</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.  +ve</td>
<td>+ve</td>
<td>-ve</td>
</tr>
<tr>
<td>B.  -ve</td>
<td>+ve</td>
<td>+ve</td>
</tr>
</tbody>
</table>
52. When the reaction in the mixture has completed, the liquid is again tested with all three kinds of food tests. Which of the following shows the correct results?

<table>
<thead>
<tr>
<th></th>
<th>Benedict’s test</th>
<th>Albustix paper test</th>
<th>Iodine test</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
</tr>
<tr>
<td>B.</td>
<td>-ve</td>
<td>-ve</td>
<td>+ve</td>
</tr>
<tr>
<td>C.</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
</tr>
<tr>
<td>D.</td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
</tr>
</tbody>
</table>

Directions: Questions 53 to 55 refer to the diagram below which shows an experiment carried out to test for vitamin C content of different fruit juices.

![Diagram](image)

The table below shows the results.

<table>
<thead>
<tr>
<th>Fruit juice</th>
<th>Volume added to decolorize 1 cm³ DCPIP solution(cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lemon juice</td>
<td>4</td>
</tr>
<tr>
<td>Orange juice</td>
<td>5</td>
</tr>
<tr>
<td>Boiled orange juice</td>
<td>40</td>
</tr>
<tr>
<td>Apple juice</td>
<td>10</td>
</tr>
</tbody>
</table>

53. What was the effect of boiling on vitamin C?
   A. Change it to another vitamin
   B. Evaporates it away
   C. Alters its structure
   D. Change its solubility

54. Which fruit juice has the largest amount of vitamin C?
   A. Orange juice
   B. Apple juice
   C. Lemon juice
   D. Boiled orange juice

55. There is an unknown solution named X, if 40 drops of X even can’t decolorize 1 cm³ DCPIP solution. What it possibly is?
A. Kiwi fruit juice  
B. Water melon juice  
C. Water  
D. Cabbage juice

Directions: Questions 56 to 57 refer to the diagram below which shows a simple apparatus used to determine the energy content of peanut.

56. Which of the following is not a source of error  
   A. Heat was lost to the surrounding.  
   B. The burning peanut gave out light energy  
   C. The volume of water was too small  
   D. The test tube and thermometer absorbed heat energy

57. The outside of the test tube was blackened after the experiment. Why?  
   A. The glass was charred on heating.  
   B. Peanut oil was condensed on the glass surface  
   C. Peanut oil react with the glass to form a black compound  
   D. Incomplete combustion of peanut produced soot