* 1. **[Nutrition in Plants and Animals (59 Lessons)](http://www.elimu.net/Secondary/Kenya/KCSE_Student/Biology/Form1/Nutrition/KCSE%20Biology%20Curriculum%20Form%20I%20-%20Nutrition.htm)**

1. a) Emulsification;

b) Breaks down large fat /lipids substances to tiny droplets to increase surface area for enzyme lipase to work on;

c) Bile /bile salts;

***NB (c) is tied to (a)***

2. Water is split during photolysis to provide hydrogen ions that are used in the dark stage;

3. a) to investigate the effect of heat on enzyme ptyalin

* 1. A: - Iodine solution turned blue- black;

B: - brown – colour of iodine remained;

* 1. A: - boiling denatured enzyme ptyalin, hence no enzyme to hydrolyse starch to maltose;

B: - Enzyme ptyalin hydrolysed starch to maltose; hence iodine test for starch is negative;

* 1. Optimum temperature for enzyme action// normal human body temperature for enzyme action; (e) Enzymes are denatured at temperatures beyond optimum;

1. a) Canine; ¹
   1. Tearing; ¹
2. (a) Holozoic, parasitism¹, saprophytism, symbiosis; Any two

(b) It involves breakdown of fats into small fat droplets which is a mechanical activity; ¹ The fats are not chemically charged.

1. a) (5 + 10)2 = 30 (1mk)

b) (i) Herbivorous;

(ii)Lacks upper incisors (1mk);

Lacks canine teeth (1mk); (Any one answer)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7. - High temperature above 400c;  - PH/ strong acid; |  |  |  | (2mks) |

8. - Lubricating food; (2mks)

* Provide alkaline medium;
* Digestion of starch;

1. a) Photosynthesis; (1mk)

b) Light energy; (2mks)

-water;

-availability of carbon (Iv) oxide;

-Chlorophyll;

10.(a) (i) As the temperature increases, the rate of reaction increases; the increase in temperature increases the kinetic energy in the enzyme molecules; this increases the rate of collision hence the increase in the rate of reaction;

(ii) The rate of reaction decreases; this is because the enzyme got denatured due to high temperature. (2mks)

(b) maximum rate of reaction /optimum temperature for enzyme, (1mk)

(c) - changes in ph

* + - * Substrate concentration
      * Enzyme concentration
      * Enzyme inhibitors (any two) (2mks)

12. a) Photosynthesis;

b) i) A – Negative test / starch absent; (1mk)

B – Positive test / starch present; (1mk) ii) Sodium hydroxide absorbed all the Carbon(IV) Oxide hence no photosynthesis

* 1. Control experiment;
  2. Light energy is s absorbed by chlorophyll molecules; used to split water molecule into oxygen and hydrogen atoms/ ions; light energy is converted into chemical energy (ATP) and stored;

13. Starch in food is first broken down in the mouth by action of teeth/ chewing; This increases the surface area exposed enzyme action; saliva contains salivary amylase which breaks down some starch to maltose; saliva has a slightly alkaline pH which is optimum for the enzyme; The food moves down to theoespophagus and stomach; where the acidic pH, due presence of dilute Hcl, prevents further action of salivary amylase; In the duodenum, pancreatic amylase continues digestion of starch to maltose; Pancreatic amylase is produced in the pancrease; and enters the duodenum through pancreatic ducts; the acidic chyme is neutralized by the sodium bicarbonate in bile/ pancreatic juice; Maltose digestion continues in the ileum; whose walls secrete succus entericus/ intestinal juice; which contains enzyme maltase; which breaks down maltose to glucose; (Max 13 marks)

14. (a) Pepsin

Trypsin

b) Pepsin - Hydrochloric acid

Trypsin - (enzyme) enterokinase

15. a) Herbivorous (1mark)

b) No upper incisor and canine (1mark)

* 1. Slice flesh and crush bones (1mark)

1. Pepsin is secreted in its inactive form (pepsinogen) and is only activated in the presence of food. Stomach lining is coated with mucus secreted by the goblet cells in the stomach mucosa

17. (a) Oxyntic cells; (1mk)

* 1. B – Dentine (1mk)

D – Gum (1mk)

18. (a) (i) Iodine solution; rej. iodine only;

(ii) To investigate the effect of temperature on enzyme activity; (2mks)

1. P – Starch was absent; (1mk) Rej. mixture remained brown;
   1. – Starch was present; (1mk) Rej. blue black colour (2mks)
2. P – Starch was digested into maltose enzyme in the saliva; (1mk)
   1. – Starch was not digested because boiling the saliva denatured the amylase; / ptyalin enzyme in the saliva; (1mk)
3. (i) This is the optimum temperature for enzyme action; (1mk)

(ii) Glycogen; (1mk)

19. Nitrogen;

Strengthens plant cell walls/formation of the middle lamellae during cell division/ protein synthesis;

Stunted growth; (3 marks)

20. a) All active sites of enzymes are occupied; (1 mark)

* 1. Increasing the concentration of enzymes / adding more enzymes; (1 mark)