TERM 2 - 2023

BIOLOGY – PAPER TWO (231/2)

FORM FOUR (4)

MARKING SCHEME

Question 1

(a) Effect of high temperature on enzymes; ***1x1= 1 mark***

(b) **P** colour of iodine retained starch absent; ***1x1= 1 mark***

Q colour of iodine turned blue black starch present; ***1x1= 1 mark***

(c) **P** enzyme/ salivary amylase is active, starch was digested to maltose ***1x1= 1 mark***

Q enzyme/ salivary amylase denatured by heating/ boiling saliva, starch was not broken down / digested to maltose ***1x1= 1 mark***

(d) Provide optimum temperature for enzyme action; ***1x1= 1 mark***

(e) i) glycogen; ***1x1= 1 mark***

ii) starch; ***1x1= 1 mark***

Question 2

(a)

Parental genotype **AO** **X** **BO** ;

Gemetes **A** **O** **B** **O** ;

Fusion ;

F1 offspring **AB** **AO** **BO** **OO**

Genotypes of children **AB, AO, BO, OO** ;

4x1= 4 marks

(b) 1 Blood Group AB : 1 Blood Group A : 1 Blood Group B : 1 Blood Group O ; ***1x1= 1 mark***

(c) (i) Blood group AB; ***1x1= 1 mark***

(ii) Lack antibodies; hence receive blood from all blood groups without triggering an antigen-antibody reaction; ***1x1= 1 mark***

(d) Massive destruction of red blood cells of the foetus due to antigen-antibody reaction of Rhesus positive and negative blood; ***1x1= 1 mark***

Question 3

(a) Oxygen; ***1x1=1 mark***

(b) Presence of light; presence of chlorophyll; suitable temp/ optimum temperature; ***2x1= 2 marks***

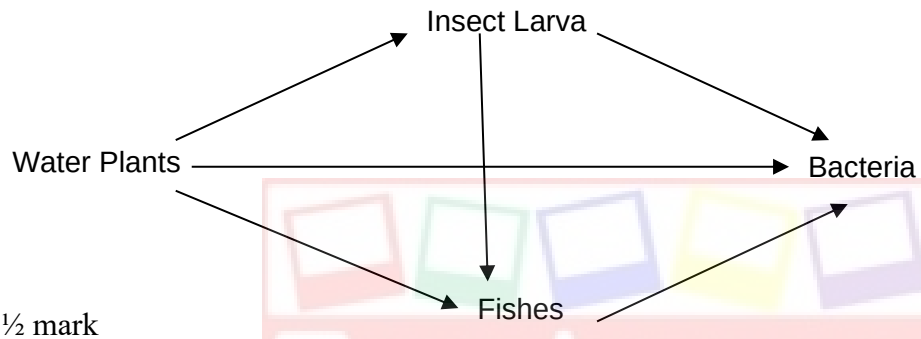
(c) Palisade cells; palisade mesophyll; spongy mesophyll; ***2x1= 2 marks***
(d) Photosynthesis; ***1x1= 1 mark***
(e) Fatty acids; and amino acids; ***2x1= 2 marks***

Question 4

(a) Where organism in various trophic levels don't exceed the carrying capacity; ***1x1= 1 mark***

(b) 500 + 1200+5000+10 = 6710g or 6.71kgs ***2x1= 2 marks***

(c) (i) Water plants; ***1x1= 1 mark***
(ii) Fishes; ***1x1= 1 mark***



Each ½ mark
Arrow points at the feeder ***6 x ½ = 3 marks***

Question 5

1.

a) P. Hair follicle; ***1x1= 1 mark***

Q. Sebaceous gland; ***1x1= 1 mark***

R. Sweat gland; ***1x1= 1 mark***

b)

Q. Secretes sebum; ***1x1= 1 mark***

T. Consist of actively dividing cells that produce new cells to replace cells lost/cells contain melanin that protect skin against harmful ultraviolet rays from the sun; ***1x1= 1 mark***

b) It secretes sweat, water in sweat evaporates; carrying away latent heat of vaporization hence leaving a cooling effect; ***1x1= 1 mark***

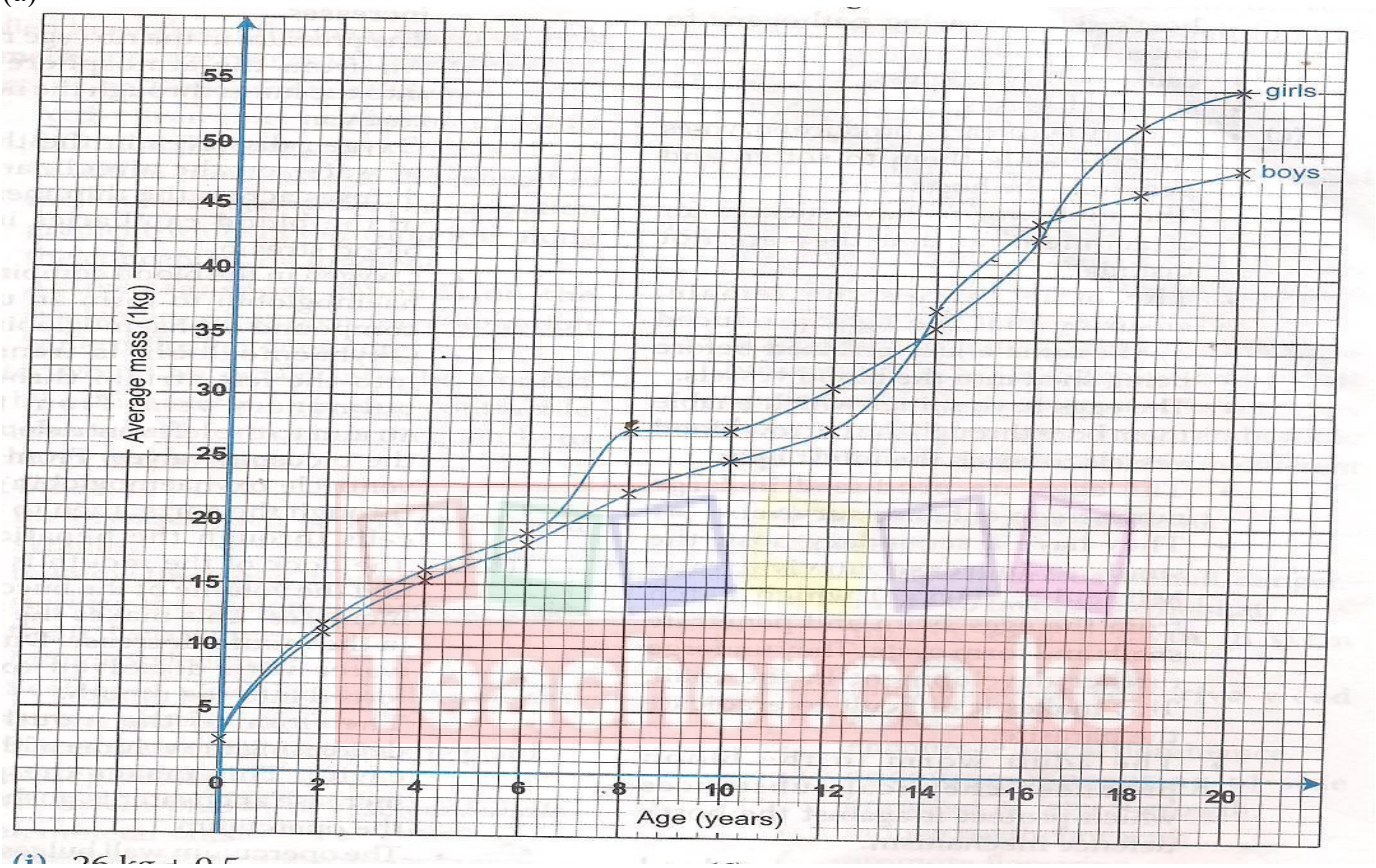
c) Reception of stimuli;

Protection of internal organs and tissues;
Storage of fat;
Excretion;

Synthesis of vitamin D; ***2x1= 2 marks***

Question 6

(a)



Scale: 1mk ×2=2mks
Axes: 1/2mk ×2=1mk
Plotting: 1mk ×2=2mks
Curve: 1/2mk ×2=1mk
Labeling: 1/2mk ×2=1mks

(b)
(i) 26 kg; +_0.5 ***1x1= 1 mark***
(ii) Girls 15 years -39
Girls 13 years -33
39-33 =6/2= 3.0kgs/year ***3x1= 3 marks***
(c) There is an increase in mass; because girls at adolescence grow faster;

(d) Girls generally grow faster than boys; boys grow slowly compared to girls but later after puberty they grow more steadily; ***2x1= 2 marks***

(e) Menstruation cycle begins hence they need more iron to replace blood lost during menstruation;

1x1= 1 mark

(f) Genetic composition;
Sex of the child;
State of health
Emotional status ***2x1= 2 marks***

(g) Height of the body;
Volume of the body; ***2x1= 2 marks***

Question 7

Comparative anatomy / taxonomy;
Members of a phylum / group show similarities ; organisms have structures / organs performing the same function ; e.g. digestive system ; nervous system same function etc (any correct example 1mk)

The pentadactyl limb / any correct example; these are called homologous organs / structures; homologous (same origin but have different function; Analogous structures / different structures performing the same function e.g. wings of insects, bat and birds; Analogous – different origin but performing same function;

Fossil records / Paleontology; remains of organisms preserved in naturally occurring materials for many years; show morphological changes of organisms over a long period of time; e.g. skull of man (leg of horse)

Comparative embryology; embryos of vertebrates have similar morphology; suggesting the organisms have a common origin / ancestry ;

Geographical distribution; continents present are thought to have been a large landmass; joined together; as a result of continental drift; esolation; occurred bringing about different patterns of evolution; e.g. Llamas in the Amazons resemble the camel / any other correct example e.g. kangaroo in Australia Jaguar in S. America; camel in Africa;

Comparative serology / physiology ; antigen – antibody reactions / RH factor/ blood groups / haemoglobin structure reveal some phylogenetic relationship among organisms / common ancestry.

Max 20mks

Question 8

- Has secretory glands / crypts of lieberkuhn which secretes enzymes (maltase / sucrase / peptidase / lipase to complete digestion of lipids / sugar / proteins.
- Goblet cells secrete mucus allows for smooth movement of food / protect wall of ileum from action of digestive enzymes
- Very long to provide large surface area for absorption
- Highly folded / coiled to slow movement of food to allow more time for digestion / absorption / increase surface area for absorption.

- Has numerous villi which increase surface area for absorption / microvilli which further increase surface area for absorption.
- Ileum wall / villi have thin epithelium which is only one cell thick to reduce distance over which digested food has to diffuse.
- Villi are highly vascularized / have a rich network of blood capillaries for rapid transport from small intestines / maintain a steep concentration gradient.
- Villi have lacteals for absorption of fatty acids and glycerol
- Cells of the ileum wall have a large count of mitochondria to release energy that aids in active transport across the epithelium.

Max 20mks