BIOLOGY
FORM 3
PAPER 2
MARKING SCHEME

	Visking tubing		Beaker	
Set up	Iodine solution	Benedicts solution	Iodine solution	Benedict's solution
A	***Iodine solution turns black/blue black***	***Benedicts solution turns green, yellow, brown and finally orange***	***Iodine solution remains yellow/brown***	***Benedicts solution turns green, yellow, brown and finally orange***
B	***Iodine solution remains yellow/brown***	***Benedicts solution turns greens, yellow, brown and finally orange.***	***Iodine solution turns black/blue black***	***Benedicts solution turns green and finally yellow***

Question 2

a) Diffusion

b) X – oxygen
Y- carbon (iv) oxide

c) Lack nucleus to pack a lot of haemoglobin; Biconcave in shape to increase surface area for gaseous exchange;
Able to change their shapes to squeeze through narrow capillaries.
Are many to increase oxygen carrying capacity.

d) Moist for respiratory gaseous to dissolve large surface area for gaseous exchange high vascularised for rapid transportation of respiratory gases.
Thin walled for respiratory gases to diffuse over short distance.

Question 3

1. a) i) Description of type , arrangement and specialisation of teeth 1mk

ii) Homodont	Heterodont
Same size, shape and function.	different size, shape and function;
	N/B each score independently 2mks

b) Site for digestion ;
site for absorption; 2 mks

c) i) Traps / absorbs sunlight for photosynthesis; 1 mk
ii) Splits water molecules to hydrogen and oxygen gas; 1 mk

d) Transmission of nerve impulse 1 mk

Question 4

a) X – Polar nuclei;

Y – Ovum (egg cell) ;

Z- Integuments ;

b) - Dissolves the tissues of the stroma ,style and ovary ;

- Forms pathway for the male nuclei to reach the embryo sac;

c) - They disintegrate ;

d) - Male nuclei ;

- One fertilizes the egg cell and the other fertilizes the polar nuclei ;

Question 5

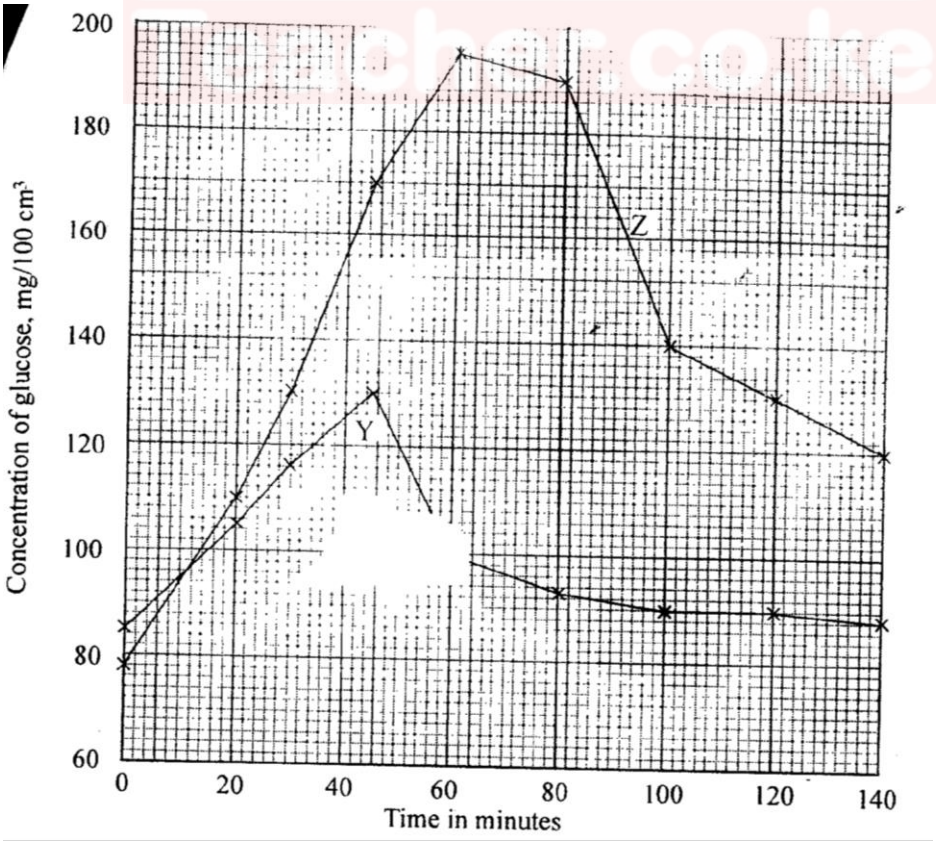
la) A- Epidermis / √2mrks
B-Pith

b) C (Phloem)- Transports manufactured food from the leaves to the rest of the plant .
D (Cambium) - They divide to form new cells that are added to older ones; brings about secondary growth √1
(Xylem) - Transports water and dissolved mineral salts from the Oi1 to other parts of the plant. /

c)

Section of the stem	section of the root
1. Lacks root hairs	1.Has root hairs√1
2. Has a pith	2. Lack a pith√1
3. Vascular bundles arranged radially	3. The xylem is star shaped with√1 phloem in between their arms or extension
4. It has a cambium ring	4. Lack a cambium ring **3mrks**

Question 6



S – ½ x 2 = 1

C – 1 x 2 = 2

A – ½ x 2 = 1

P – 1 x 2 = 2

Total = 6mks

b) Y – 120mg / 100cm^3 ± 1;

Z – 178mg / 100cm^3 ± 1; (2mks)

c) i) Blood sugar level increased to 130 mg / 100cm^3; glucose is being absorbed from the intestines;

- Some of it by – passes the liner without entering the cells thus raising blood glucose level;

ii) Glucose concentration declined to normal 90mg / 100cm^3 high blood glucose stimulates the pancreas to produce insulin ; which stimulates the liver cells to take up glucose ; and consists it to glycogen; (4mks)

e) Some of the glucose is used in respiration to generate energy; some is lost in urine;(2mks)

Question 7

7. a)

- Embryo may not be fully developed / ; immature embryo;
- Presence of chemical inhibitors;(that inhibit germination in seeds e.g abscisic acid.
- Very low concentrations of hormones e.g gibberllins; and enzymes reduces the ability of seeds to germinate)
- Hard and impermeable seed coat prevent entry of air and water in some seeds e.g (wattle)
- In some seeds the absence of certain wavelengths of light; make them remain dormant).
- Freezing of seeds during winter lowers their enzymatic activities; (rendering them dormant)

b) i) **Water**

- Activates the enzymes and provides the medium for enzymes to act and break down the stored food into soluble form.
- Water hydrolyses and dissolves the food materials; and is also the medium of transport; of dissolved food substances through the various cells to the growing region of the radical and plumule.
- Softens the seed coat to facilitate emergence of the radicle / plumule;

ii) **Oxygen**

- Necessary for respiration to provide energy; (needed for germinating seeds in division and growth)

iii) **Temperature**

- Seeds will not germinate at O°C or above 47°C
- The optimum temperature ; for seeds to germinated is 30°C.
- High temperature kill the protoplasm / destroy protoplasm / denatured Enzyme.
- At very low temperatures the enzymes are inactive.
- Rate of germination increase with temperature until it reaches an optimum.

iv) **Enzymes**

- Facilitates the oxidation of stored food substances to release energy/ carbohydrates respiration to release energy.
- Hydrolyse carbohydrates to glucose, lipids to fatty acids glycerol, protein to Amino acids.

Question 8

Adaptations of mammalian skin

8. Cornified layer made up of dead cells; that prevent entry of bacterial / prevent physical damage / dessication;

(Malphiagian layer) secretes melanin ; which protects the body against U.V radiation;

Malphigan layer have actively dividing cells ;that give rise to the granular layer;

Sebaceous glands produce sebum / oil substance; which is antiseptic / kills bacteria ; keeps hair subtle;

Presence of blood vessels (in dermis) which dilate when body temperature is high ; to lose heat ; Or : Which constrict when the body temperature is low ; to retain heat ;

Blood vessels provide nutrients / oxygen to cells of the skin; remove nitrogen wastes / carbon IV Oxide which produce sweat ;

Which when it evaporates from skin surface cools the body / lowers body temperature;

Presence of sensory cells / nerve endings sensitive to pain / touch / heat / cold; enable organism to respond to changes in environment;

Subcutaneous fat / adipose tissue; insulate the body against heat loss;

Has hair follicle which erect when body temperature is low; to trap air which insulate the body against heat OR which lie flat when body temperature is high to trap less air to allow more heat loss;