BIOLOGY 231/3
MARKING SCHEME

Food substrate being tested for	Procedure	Observation	Conclusion
Protein	To 2cm3 of solution M in a test tube, added sodium hydroxide, then 3 drops of copper sulphate to the mixture	Colour changes to purple	Protein present
starch	To 2cm3 of solution M in a test tube, added 3 drops of iodine solution	No colour change;	Starch absent
Non reducing sugar	To 2cm3 of solution M in a test tube, added 3 3 drops of dilute hydrochloric acid; warmed for 3 minutes cooled in cold water, added sodium hydrogen carbonate dropwise till fizzing stops; added Benedicts solution and boiled;	Colour changes from Bile-Green-Yellow –orange.	Non- reducing sugars present;

Total =14mks

2. (a) (i) (Root) Nodule
(ii) Rhizobium/ Rhizobia
(iii) Symbiotic relationship/Mutualism –the nodule on the root offers shelter for the bacteria (rhizobium) which in turn fix nitrogen gas into ammonia which is then utilized by the plant to make protein
(b)(i) M- arid /semi –arid
N- Arid/semi-arid
P- Average/mesophytic/abundant water
(ii) has thick waxy cuticle to minimize the rate of cuticular transpiration
Leaves are succulent /fleshy/juicy to store water
Leaves are reduced in size/modified to spines to reduce the surface area over which transpiration occurs
3.(a)(i) P-stomach
Q-Kidney
R-Colon
S-Caecum
T- ileum
U- Liver
V- Heart
(ii) Colon
(b)(i) Completion of digestion of all the food substances
Absorption of the digested food
(ii)(i) Has villi and micro villi which increase surface area for absorption/digestion of food
(ii) Has thin epithelium through which digested food difuses
(iii) Highly vascularised coiled to slow down movement of food.
(iv) Has a dense network of blood capillaries for absorption
(v) Presence of lacteals in the villi for absorption of fatty acids and glycerol
(c) Osmoregulation
Excretion
(d) Regulation of blood sugar level
Thermoregulation
Discrimination