WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
Uganda Certificate of Education
BIOLOGY 553/1

1. C	7. D	13. D	19. D	25. C
2. A	8. B	14. B	20. A	26. C
3. B	9. A	15. C	21. D	27. D
4. D	10. C	16. B	22. C	28. B
5. A	11. ~~D~~ A or D	17. A	23. B	29. A
6. C	12. C	18. B	24. A	30. C

31. a) *As on the graph at the back*

b) (i) Conc. Of glucose was low and constant; because digestion had not occurred to form glucose; for absorption; the glucose present was the original one before the meal;

(ii) Rapid increase in glucose concentration; was due to increased digestion of food to form glucose; and its absorption at ileum into blood stream; 1 ½ @

(iii) Decrease in glucose concentration; was due to decreasing digestion since it was almost complete; hence less glucose was being absorbed at the ileum; ½ @

(iv) Constant level of glucose; because digestion was completed; and therefore no further absorption of glucose at the ileum; ½ @

(c) Lower level of glucose in the ileac vein; because some glucose was removed from blood and used in the tissue respiration in liver cells; Some is converted to glycogen; for storage; some glucose is used by other organs like the heart for energy production. There is higher level of glucose in Hepartic portal vein; because it receives all the digested and absorbed glucose from the ileum directly; (and none is yet used for respiration/ stored;)

1 mark @
05 marks

32. a) (i) When placed in 0.2M solution the plant cell absorbs/ takes in water; ✓ by osmosis; ✓ because plant cell is hypertonic to solution/ more concentrated to the solution; ✓

½ mark @
03marks

(ii) When placed is 0.4M solution the plant cell loses water; ✓ by osmosis; ✓ because plant cell is hypotomic to the solution / less concentrated to the solution; ✓

inhibition of aldosterone secretion hence more ions to be lost through urine.
- feeling thirst.
- Increase in blood osmotic pressure.
thirst.

b) The person would die; because his/her blood would drain water from tissues; causing dehydration of the tissue;

½ mark @
03marks

c) In kidney where water is re-absorbed/ in the colon where water is absorbed; ✓
acc-nephron
03marks
10marks

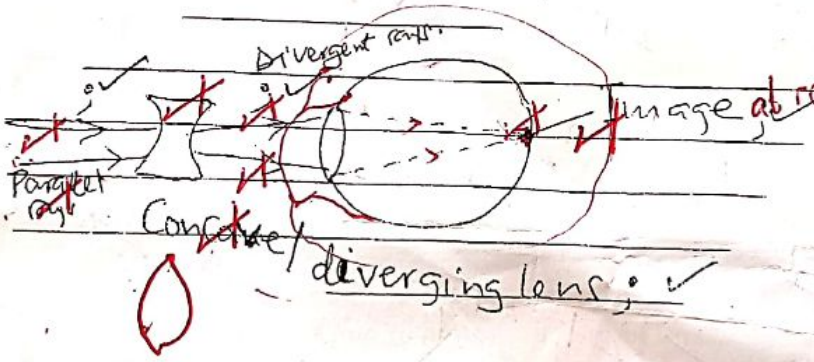
Circular muscles of the iris contract, while & radial muscles relax
iris lengthens and narrows/reduces the size of the pupil

33. a) Circular muscles of the iris contract; ✓ while the radial muscles relax; ✓ a
02marks

b) (i) Short sightedness/ myopia. 01mark
thick or strong lens. accp shortsight

(ii) The eye ball is long; ✓ so light from distant /far object is focused before the retina; ✓ which makes the image blurred; ✓
must
rej explanation without a cause.

(iii)



03marks
-Label tied to drawing.
04marks
10 marks

1.

SECTION C

34. a) Air is less dense than water; So less energy is needed to move air over the respiratory surface;
viscosity
It has a higher oxygen content than water; So more oxygen is obtained from the little concentration/ amount of air;
Oxygen diffuses faster in air than water; So a high concentration gradient is easily maintained between air and blood;
slight increase in temp cause diffuse of O_2 from water unlike in water where O_2 is stable at all temperature; hence air can provides organisms at higher temperature.
01mark@
Total 6 marks
Max 5 marks
10mark
any 3 points.
6 marks.

b) (i) Tracheal system is highly branched/ divided into tracheoles; to increase area for gaseous exchange; 1 mark@
numerous

(ii) Mammalian lungs have numerous alveoli highly folded; to increase surface for gaseous exchange; 1 mark @
alveoli
trachea – branches – bronchioles – alveoli due to numerous alveoli

(c) Air is less dense than water; so when a fish is in water the gill filaments are wide spread; giving them a large surface area for gaseous exchange; but when it is in air
the mouth & operculum muscles.

the gill filaments are closer/ collapse onto each other; reducing surface area for gaseous exchange hence easily suffocates when removed from water;

1 mark @
~~Total 4 marks~~
~~Max 3 marks~~

35. a) Pollution is the natural/ artificial addition ~~of toxic/ harmful~~ substances /energy to an ecosystem; to such levels that harm part or the whole of it;

02 marks

b) Effects of air pollutants on human healthy.

- smoke; reduces vision it also blackens the lining of lungs and so reduces area for gaseous exchange;
- fog; causes respiratory disease which can cause death;
- Sprays/ insecticides/ pesticides Cause respiratory disorder.
- Carbon monoxide; combines with hemoglobin and reduces the capacity of blood to carry respiratory gases
- Carbon dioxide; accumulation in the atmosphere forms a blacket preventing escape of heat to the upper atmosphere hence causing global warming;
- Lead tetra ethyl from cars contaminates vegetation and if such plants are eaten by man affects his health by damaging brain, loss of weight and causes anemia;
- Nitrogen monoxide and nitrogen dioxide cause discomfort to man (like eye irritation)

Pollutant 1mark
Effect 1 mark
Rej. Effect without pollutant
Total 14
Max 13

36. a)
- Photosynthesis leads to formation of oxygen needed for respiration by man;
- It maintains the level of carbondixiode in the atmosphere which would otherwise cause global warming, that in turn cause discomfort to man;
- Provides food to man;

1 mark @
03marks

b)
- It is generally broad to increase surface area for trapping sunlight for photosynthesis;
- It is transparent to allow light penetration to chloroplasts;
- It has waxy cuticle to prevent water loss;
- It has phloem to transport away the manufactured food;
- It has xylem to transport water to photosynthetic tissue;
- Has numerous stomata to take in carbon dioxide;
- Has many chloroplasts needed to trap sunlight energy for photosynthesis;

01

- Has large inter cellular air spaces for gaseous exchange during photosynthesis; spongy mesophyll

Consider the first correct 6
Description of adaption and relevance paired.
1mark@

Structure alone / Correct structure with wrong function ~~alone~~ give; function without structure / Wrong structure with correct function; rej.

c) Differences between respiration and photosynthesis

Respiration	Photosynthesis
Occurs in all living cells of plant and animals	occurs only in plants with chlorophyll pigment;
Occurs at all times	occurs only in presence of light;
Carbon dioxide is produced	carbon dioxide is raw material.
Oxygen is used in aerobic respiration	oxygen is a bi product.
Water is produced	water is majorly raw material
Energy is produced	sunlight energy is absorbed
Slower process in green plants	faster process in green plants.

Takes place in mitochondrion — Takes place in chloroplast

glucose inward / catabolic dry weight reduces. — glucose product / anabolic dry weight increases.

Any first 6 correct differences

37. a) (i) Heart beat increases; in order to pump more blood; which delivers more oxygen and glucose to muscles; to generate more energy; for muscle concentration and to remove the accumulated waste products from muscles;

Marking point at the end of every point.

Total 6 max **05 marks**

(ii) Breathing rate increase; so as the person to take in more oxygen for the increased aerobic respiration; and to remove the accumulated carbon dioxide from the body of the person;

Total 4 Max 3 marks

b) Description of adaptation of heart to its functions.

- It has tricuspid and bicuspid valve; to prevent back flow of blood to the atria;
- Possession of intra ventricular septum; to separate deoxygenated blood from oxygenated blood;
- Its left ventricle walls are thick; to pump blood to far parts of the body;
- It has strong Cardiac muscles which are myogenic in nature; to contract and relax continuously as it pumps blood;
- Presence of many mitochondria to generate ATP / energy for continuous contraction of cardiac muscles

– Presence of vessels for supply of oxygen & glucose and take away wastes.

1 mark @ Acc. Correct structure alone. Rej. Function without structure.

END

– Presence of pericardial membrane to ~~pr~~ which produce pericardial fluid to reduce friction.
– Possession of atria to ~~pump~~ receive and ventricle to pump blood.

BIOLOGY 553/1
UCE 2022

Guest

431(a)

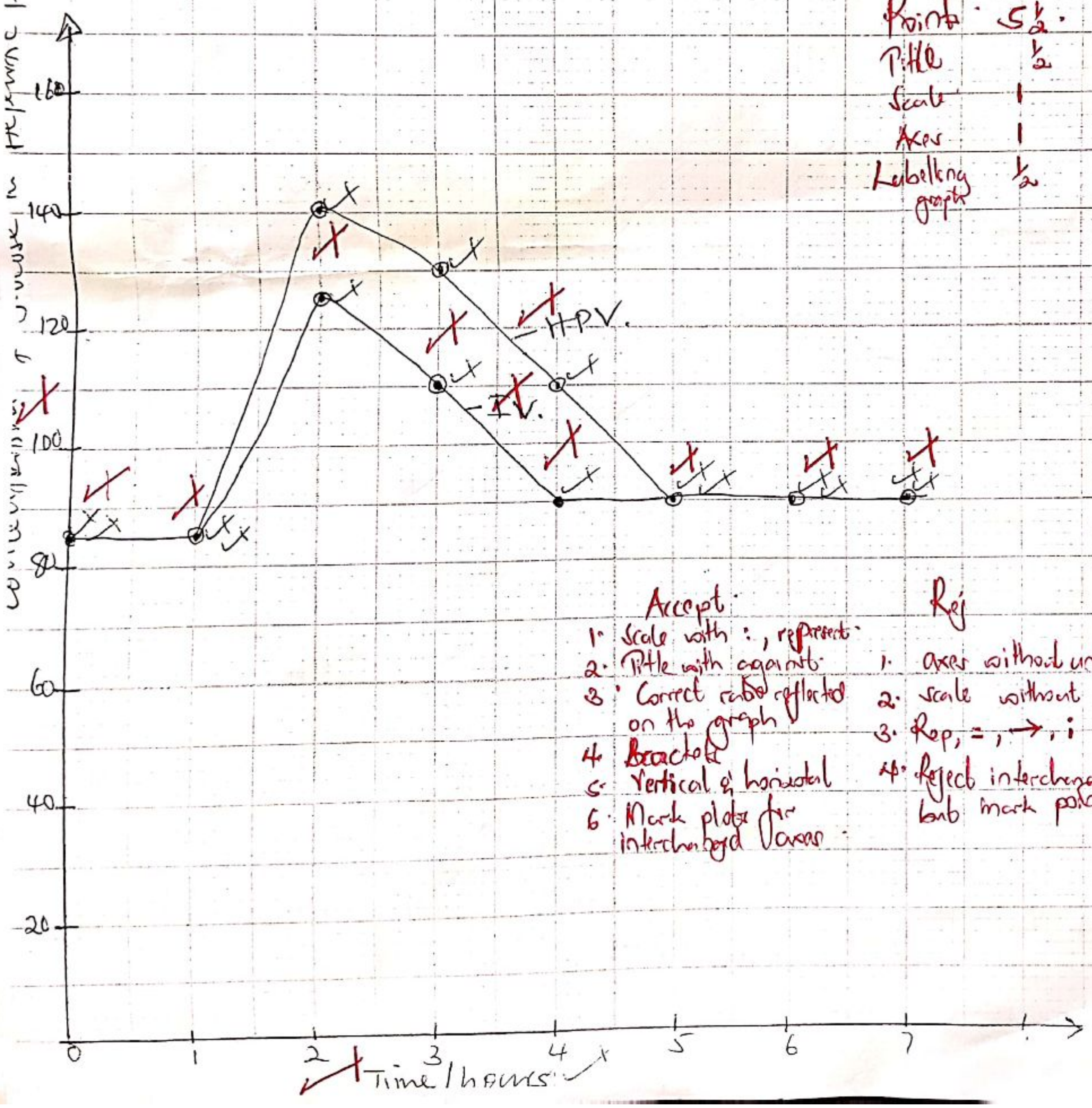
A graph showing the variation of concentration of glucose in the hepatic portal vein and ileac vein with time;

Scale

Y-axis: 1cm represents 10mg/100cm³ of blood;

X-axis 1cm represents ½ hour;

Points 5½
Title ½
Scale 1
Axes 1
Labelling graph ½



Accept:
1. Scale with :, represent.
2. Title with against.
3. Correct ratio reflected on the graph
4. Brackets
5. Vertical & horizontal
6. Mark plots for interchanged axes.

Rej
1. axes without units.
2. scale without units.
3. Rep, =, →, ;
4. Reject interchanged axes but mark points.