WAKISSHA
MARKING GUIDE
Uganda Certificate of Education
BIOLOGY 553/1

SECTION A

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

SECTION B

31. (a)

Time / min.	0	1	2	3	4	5	6	7	8	9	10
% germination	15	15	40	75	90	65	50	30	10	0	0

@ 1/4mark

(b) As on the graph.

(c) Between 0 and 1 minute; % germination remained constant;
Between 1 and 4 minutes % germination increased rapidly; up to maximum;
Between 4 and 9 minutes % germination decreased rapidly;
Between 9 and 10 minutes % germination stooped / no germination / zero germination;

4 marks

(d) Soaking in hot water softens the testa;
Increasing its permeability for gases / and water / imbibition; while un soaked seeds have a tough coat; reducing penetration of gases and water;

4 marks

(e) Heat could have destroyed the embryo; leading to no germination.
Enzymes denatured by high temperature;

2 marks

3(b)

A graph showing the variation of percentage germination of seeds with time / duration of soaking in minutes;

Scale

V/S

1cm represents 5% germination ✓

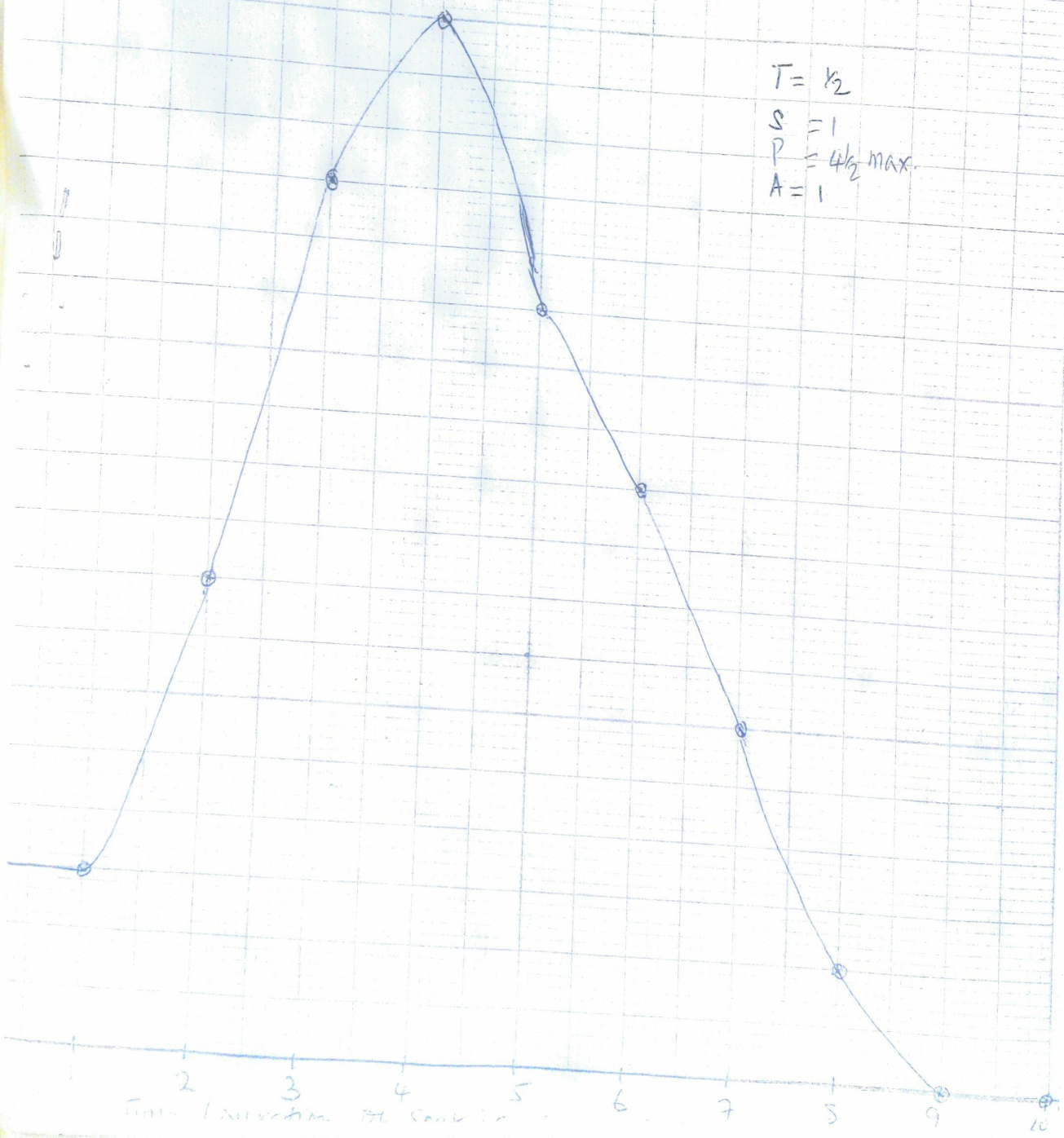
1cm represents ½ minute ✓

T = ½

S = 1

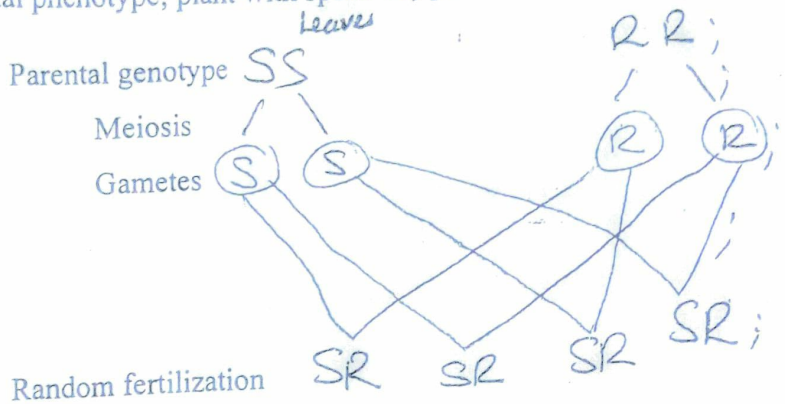
P = 4½ max.

A = 1



32. (a) (i) The two alleles which cause leaf shapes are co-dominant to each other;
1 mark

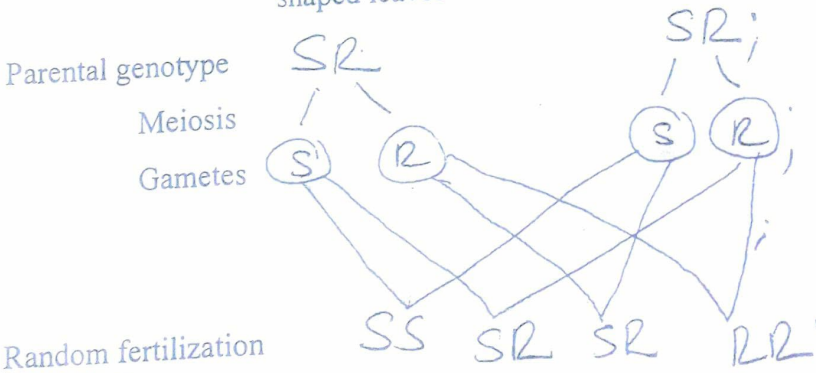
(ii) Let the allele for spear shape be S;
Let the allele for round shape be R;
Parental phenotype; plant with spear/ X; plants with; round leaves



½ mark@ **4½ marks**

F_1 generation
F_1 generation off springs have oval shaped leaves which are different from those of the parents.

(b) (i) Parental phenotype: plants with oval shaped leaves X; plants with oval shaped leaves;



Random fertilization
½ mark@ **3½ marks**

Phonotypical ratio spear shaped: oval: round
1 : 2 : 1;

(ii) Genotype of Heterozygous plants is SR; **1 mark**

33. (a) A → Neural spine;
B → Transver process;
C → Centrum; **3 marks**

(b) Thoracic verletora; 1 mark

(c) Thoracic region; 1 mark

(d) Has long neural spine for attachment of muscles;

Has transverse process for attachment of muscles/ for articulation with ribs;

Has centrum to articulation with other vertebrae;

Has facets to articulate with other vertebrae;

4 marks

(e) Lumbar vertebra; **1 mark**

SECTION C

Answer any **two** questions from this section.

34. (a)
- The alveolar surface is moist; to allow gases / oxygen and carbon dioxide to dissolve;
- It has thin epithelium; to shorten the diffusion distance;
- It is permeable to respiratory gases / oxygen and carbon dioxide; to ease their diffusion;
- The alveolar surface is relatively large; to maximize gaseous exchange;
- The alveolar surface is ventilated; to maintain a concentration gradient for the diffusing respiratory gases;

Any 4 correct structure and function
4 marks

(b) Oxygen in the alveolar space is more than that in the surrounding blood capillaries; so dissolves in the moisture living the alveolar epithelium; then through the thin wall of the alveolar epithelium; and then to blood capillaries; carbon dioxide diffuses from blood capillaries; through thin wall of the alveolar epithelium; and then into alveolar space along a concentration gradient;

6 marks

(c) (i) Physical changes that occur to air during gaseous exchange.

(ii)
- Air is warmed by capillary blood in the nostrils;
- It is moistened by mucus living the respiratory system;
- It is cleaned of particle / dust by cilia / hairs and mucus along the respiratory system;

- The composition of air changes i.e. oxygen in inspired air is more than in expired air while carbon dioxide is less in inspired air than in expired air;

4 marks

(d) Gaseous exchange is important in humans because the body is always replenished with oxygen for aerobic respiration and removal of accumulated carbon dioxide to maintain life;

1 mark

35. (a) Sound waves from the gun are collected and concentrated by the pinna; the sound waves are sent to eardrum via auditory canal; then to ossicles, oval window and cochlea;

The vibrations of ear drum; ossicles; and windows; magnify the waves; at the coclilea sound waves are converted to electrical message; and sent to the brain for interpretation via the auditory nerves; The boy becomes ware of the gun shot. The brain sends impulses to adrenal gland through the motor nerves;

The adrenal gland secretes adrenaline hormone; into blood system which has the following effects;

- Heart beat increases to pump more blood to the brain and muscles to supply more glucose and oxygen; to generate more energy;
- The pupils of the eyes dilate to allow in more light for clear vision of the area where the gun is being shot;
- Breathing rate increases to take in more oxygen for increased aerobic respiration and remove the accumulated carbon dioxide due to increased respiration;
- Glycogen is converted to glucose in the liver and sent to blood stream for transportation to muscles to yield more energy.
- Blood vessels ported to brain and muscles to deliver glucose and oxygen for aerobic respiration;
- Erector Pilli muscles in the skin contract to make hair stand on the skin causing scare;

All these structural and physical changes cause fear and enable the boy to run away.

1 mark @

36. (a) Differences between blood circulation in fish and mammals.

Fish	Mammals
- Blood in the heart flows through one atrium and one ventricle	blood in the heart flows through two atria and two ventricles;

- Heart contains and pumps only deoxygenated blood	Heart contains and pumps both oxygenated and deoxygenated blood;
- Single blood circulation	Double blood circulation;
- Blood flows at relatively low pressure and speed	Blood flows at relatively high pressure and speed;
- Oxygenation of blood occurs in gill lamellae	Oxygenation occurs in lung capillaries;

(b) (i) To lungs / pulmonary artery

- Has thick walls; to withstand blood at high pressure;
- Has narrow lumen; to allow blood flow at high pressure;
- Has elastic fibres; to allow distention as blood flows at high pressure;
- Has the ability to constrict; to withstand blood flow at high pressure;

½ marks@
4 marks

(ii) From lungs / pulmonary vein

- Has thin walls; to create a wide lumen to allow blood flow at low pressure;
- Has wide lumen; to allow blood flow at low pressure;
- Has value;to prevent back flow of blood to lungs;
- Has elastic fibres; to allow blood flow at low pressure;

½ marks@
4 marks

(c)
- Both have lumen;
- Both have elastic fibres;

1 marks@
2 marks

37. (a) Transpiration is the loss of water in form of water vapour; by plants;

2 marks

(b) Transpiration enables plant to

- absorb water;
- cools the plant as the plants
- provides latent heat of vaporization;
- absorb dissolved minerals;
- lose excess water;

4 marks

(c) Experiment to show that a plant shoot transpires.
Materials

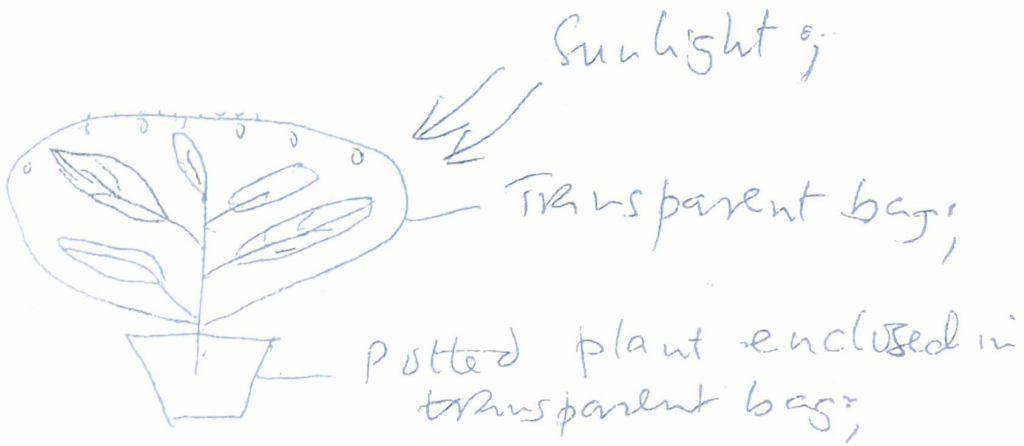
- Potted plant;
- Transparent bag;
- Anhydrous copper (II) sulphate;
- sunlight;

1 marks@
2 marks

Procedure

A shoot of potted plant is enclosed in a transparent bag; The transparent bag is used to allow sun light to reach the plant; The setup is then placed in an area where it can access sunlight; for one hour;

OR



Observations

Droplets appear on sides of the transparent bag; which when tested using while an hydrous copper (II) sulphate turns blue / cobalt chloride which is blue turns pink;

2 marks

Conclusion

These results show that droplets are of water which imply that the plant shoot has transpired.

1 mark

END