MATIGO EXAMINATIONS BOARD

553/1
BIOLOGY
MARKING GUIDE 2023
PAPER 1

Qn	Answer	Marks
	SECTION A	
1	**D**	1
2	**B**	1
3	**C**	1
4	**D**	1
5	**B**	1
6	**B**	1
7	**B**	1
8	**D**	1
9	**B**	1
10	**A**	1
11	**D**	1
12	**C**	1
13	**C**	1
14	**C**	1
15	**C**	1
16	**C**	1
17	**A**	1
18	**B**	1
19	**C**	1

20	**A**	1
21	**B**	1
22	**D**	1
23	**B**	1
24	**A**	1
25	**A**	1
26	**B**	1
27	**A**	1
28	**C**	1
29	**D**	1
30	**D**	1
	SUBTOTAL	30
	SECTION B	
31(a)(i)	This is because fresh mass is the mass of the substance when it contains water**;** while dry mass is the mass of the seedling when all the water from it has been removed**;** hence fresh mass is greater than dry mass. ***; 1 mk@***	2
(ii)	This is because dry mass gives the actual amount of living matter in the plant**;** as any additional changes as a result of water are eliminated**;** ***; 1 mk@***	2
(iii)	This is because the plant is killed in the process**;** and therefore it cannot be used again in the next weighing**;** other samples have to be used. ***;1 mk@***	2
(b)(i)	The fresh mass of the seedlings increased rapidly**;** in the first two days after the seeds were set to germinate. ***; 1 mk@***	1
(ii)	The mass increased rapidly because the water is taken**;** in to soften the seed coat and activate enzymes that catalyze the breakdown of food reserves by imbibition and osmosis**;** ***; 1 mk@***	2
(c)(i)	From 0 to 8 days**;** the dry mass of seedlings decreased gradually**;** to minimum of 0.24g**;** ***; 1 mk@***	2
(ii)	This is because the food reserve**;** is being broken down to provide energy**;** during respiration**;** for the growing embryo**;** in the seed.	2

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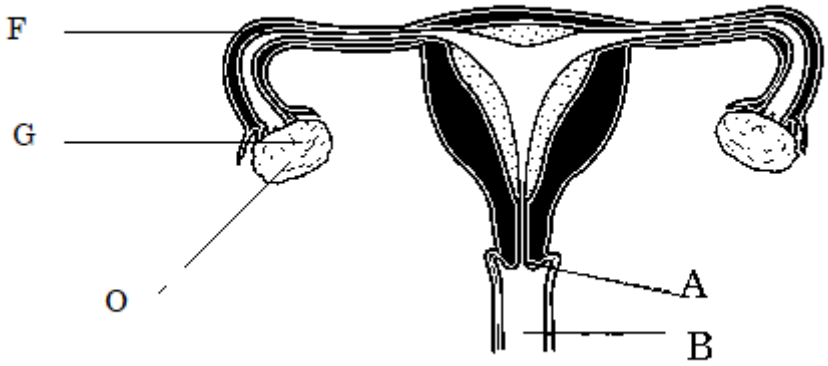
	;1 mk@	
(d)	Imbibition**;** it softens the seed coat**;** and also the water taken in activates the enzymes **(**which catalyze the breakdown of food reserves**);** Respiration**;** it provides energy to the growing embryo**;** in the seed. ***; 1 mk@***	5
(e)	-Oxygen**;** -Suitable temperature/warmth**;** -Suitable moisture/adequate water**;** Rej water and temperature alone**;** ***; 1 mk@***	3
32(a)	A- Cervix**;** B- Vagina**;** ***; 1 mk@***	2
(b)	 ***; 1 mk@***	3
(c)	-Development of breast**;** -Growth of public hair**;** -Widening of hips**;** ***; 1 mk@***	3
(d)	Ovary – Develops several follicles one of which fully develops into a mature /Secrete oestrogen hormone**;** Uterus –Repair and development of uterine walls**;**	2

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33(a)	(i)sun**;** (ii) Evaporation**;** (iii) Transpiration (evaporation)**;** (iv) Condensation**;** ***; 1 mk@***	4
(b)	-It is a raw material for photosynthesis**;** during which combine water with carbon dioxide to make food -It is used for cooling**;** plant during transpiration where heat is lost (latent heat of vaporization) -Transport of materials in solution form**;** -For opening and closing of stomata**;** -Activates enzymes**;** -Increase cell volume; which leads to cell elongation/growth**;** -Provides support in non woody plants**;** ***Any two. ; 1 mk@***	2
(c)(i)	The sap vacuoles of root hair cells are more concentrated than the surrounding soil water**;** water moves into the cells of the root hairs by osmosis**;** which when becomes less concentrated**;** than the sap vacuoles of the next root hair cells and water keeps moving along a concentration gradient**;** up the plant by osmosis**.** ***; ½mark @*** **;**	2
(d)	Sea water has high salt concentration**;** it is more concentrated than sap vacuole of the plant cells**;** water move out of the root hair cells by osmosis**;** into the surrounding water**;** ***; ½mark @***	2
	SUBTOTAL	40
	SECTION C	
34(a)	These are cells or organs that receive the stimulus**;** and change it into a nervous impulse**;** ***; 1 mk@***	2
(b)	Light from an object is refracted**;** by cornea **;**aqueous humour**;**lens**;**vitreous humour**;** and finally focusing the image**;** ***; ½mark @***	3

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(c)(i)	Accommodation of near object. Divergent light rays enter the eye**;** through the cornea which refracts it**;** then enters through the pupil**;** ciliary muscles contracts**;** while suspensory ligaments loosed/relax and slacken**;** tension on the eye lens reduces**;** the eye lens becomes short**;** thicker**;** and spherical in shape**;** and its focal length reduces**;** ***; ½mark @***	5
(c)(ii)	Accommodation of far distant object. Parallel light rays enter the eye**;** through the cornea which refracts it**;** then enters through the pupil**;** ciliary muscles relax**;** while suspensory ligaments contract**;** tension on the eye lens increases**;** the eye lens becomes long**;** thin **;** and oval in shape**;** and its focal length reduces**;** ***; ½mark @***	5
35(a)(i)	Water; suitable temperature; mineral salts; light; pH; hereditary factors; predation; competition; disease; pollution. ***Any 2 ; 1 mk@***	2
(ii)	-Apical meristems (tip of a shoot)**;** -Lateral meristems (cambium and cork cambium)**;** -Terminal buds (auxiliary or lateral buds)**;** ***; 1mark @***	3
(b)	**Title.** An experiment to determine the region of growth in the root of a bean seedling**;** **Materials** Cornical flask**;** bean seedling**;** ruler**;** water**;** cork**;** pin**;** Indian water proof ink**;** **Procedure.** -Take a bean seedling with a straight radical about 2cm long**;** -Mark the radical with Indian water proof ink**;** at a 2 mm interval**;** -Pin the seedling to the bottom of the cork**;** and fix it to the cornical flask containing a little water**;** as shown in the set up below -Place the flask in a dark place (to avoid phototropic effects)**;** and allow the radical to continue growing for 1-2 days**;** **Set up**	10

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	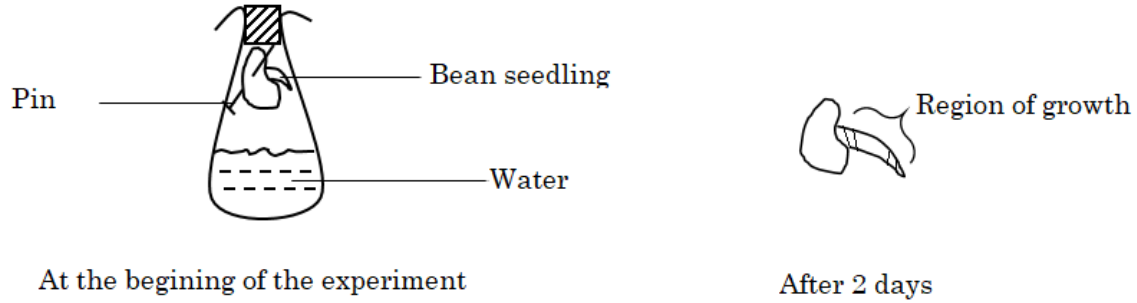 At the begining of the experiment After 2 days ***; ½mark*** **Observation** A short distance behind the tip of the root**;** the markings are further apart while further back**;** there is no change in the length of the gaps**;** **Conclusion** The region of growth in a root is a short distance behind the tip of the root**;** ***; ½mark @***	
36(a)	**When tap water is taken.** Much water is absorbed**;** from the alimentary canal**;** and blood will contain more water**;** than required by the body.**;** Osmoreceptors cells **;**in the hypothalamus**;** becomes less stimulated; less ADH is produced**;** permeability of the tubules to water is reduced**;** less water reabsorbed in the kidney tubules**;** more dilute urine produced/passed out**;** osmotic pressure of blood and tissues fluid rise again**;** **When concentrated salt solution taken.** Much salt will be absorbed**;** into the blood stream**;** blood will contain much salt than is needed**;** osmotic pressure of blood rises above normal**;** osmoreceptors cells in the hypothalamus **;**are more stimulated**;** more ADH released**;** from the pituitary gland**;** into blood stream. More water reabsorbed**;** in the kidney tubules; little amount of concentrated urine produced**;** and blood osmotic pressure is lowered to normal.**;** ***; ½mark @***	11
(b)	How excretion is achieved in plants.	4

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	-CO_2; O_2 add water vapour diffuses through the stomata; lenticels and also through thin cuticles of aquatic plant.**;** -Tannins are lost through the barks of stems and exposed roots or during leaf and fruit fall.**;** -Some poisonous wastes are converted to non toxic substances which are deposited in ageing structures like fruits; leaves; stems or specialized tissues.**;** The wastes are lost when these structures fall or die.eg wastes like nicotine; cocaine etc. -Some of the waste products can be reversed in other vital processes e.g. CO_2 from respiration can be used during photosynthesis**;** ***; 1mark @***	
37	**Follicle stimulating hormone (FSH);** -Produced by the anterior pituitary gland**;** -Stimulates the development of graafian follicles**;** -Stimulates the follicle cells to start secreting oestrogen**;** **Leutenising hormone (LH);** -Brings about ovulation**;** -Induces the remains of the Graafian follicle to form corpus luteum which produces progesterone**;** **Oestrogen;** -Produced by the ovary**;** -Stimulates the repair and healing of the uterine wall**;** following menstruation**.** -Stimulates the production of LH**;** by the anterior pituitary gland**.** **Progesterone;** -Produced by the corpus luteum**;** -Slows down the production of LH and FSH**;** -Causes increased thickening of uterine wall**;** -Stimulates the preparation of the uterine wall for implantation**;** -Maintains pregnancy/ prevents miscarriage**;** **Testosterone;** -Produced by the testis**;**	15

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	-Stimulates the development of sperms and male secondary sexual characteristics**;** **Prolactin;** -Produced by the anterior pituitary gland**;** -Stimulates the secretion of milk by the mammary glands**;** **Oxytocin;** -Secreted by the posterior pituitary gland**;** -Causes the contraction of the muscles of the uterus during child birth; ***Any six hormones and their functions/roles.*** ***; 1mark @ Max. 15 marks***	
	SUBTOTAL	30

END

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