**231/3**

**BIOLOGY**

**PAPER 3**

**JUNE 2022**

***Kenya Certificate of Secondary Education (K.C.S.E.)***

**MARKING SCHEME**

1a)

|  |  |  |  |
| --- | --- | --- | --- |
| Food test | Procedure | Observation | Conclusion |
| Starch; | To solution X add 2 drops of Iodine solution; | Solution turns Blue-black colour; | Starch present; |
| Reducing sugar; | To solution X add Benedicts solution and heat; | Solution retains blue colour | Reducing colour absent; |

Food substance 1 mrk each

Procedure, observation and conclusion ½ mrk each

Total: Max (6 mrks)

Rej wrong spelling of food substance and award 0 mrk

Rej observation and conclusion if procedure is wrong

b i)

|  |  |  |
| --- | --- | --- |
| Experimental set up | Solution X inside the tubing | Iodine solution outside the tubing |
| Beginning of the experiment | White/cream; Rej. yellow | Yellow/Brown; Rej. Red |
| End of the experiment | Solution turns Blue-black; | No colour change/Yellow/Brown; |

4 mrks

(ii) Semi-permeable; 1 mrk

(iii) Iodine (molecules) moved into starch solution/solution X across the tubing through diffusion ; turning it blue-black; Starch (molecules) were too large such that they could not move across the tubing into iodine solution; 3 mrks

c) Diffusion; 1 mrk

2.a)

1a.Simple leaf present………………………………….go to 2;

b. Compound leaf present…………………………….. *Jacaranda mimosifolia;*

2a.Parallelvenation present…………………………… *Zea mays;*

b. Network venation present………………………….go to 3;

3a.Serrated leaf margin present………………………go to 4;

b. Smooth/ Entire leaf margin present………………. *Bougainvillea glabra;*

4a.Smooth leaf lamina present…………………………go to 5;

b. Hairy leaf lamina present……………………………. *Lantana camara;*

*rej if not scientifically written*

*Each correctly identified leaf 1mrk = 4mrks*

*Each correct statement 1/2X8=4mrks*

*Total (8 mrks)*

bi) Habitat: Arid/semi arid; ( 1mrk)

*Rej Xerophyte*

ii) Has tiny hairs on lamina to trap water vapour from the leaf cells thereby lowering saturation deficit and hence minimize water loss;

***First 1 (1mrk)***

ci) Monocotyledonae; (1 mrk) rej small m

ii) Has parallel venation;

Has a leaf sheath; rej sheath alone

Is long and narrow;

***First 1 ( 1mrk)***

3a) Y: Trachea;

X: Lung; (2 mrks)

***rej lungs***

(b i) Organ X: Passage of air; (1 mrk)

Organ Y: Gaseous exchange; (1 mrk)

ii) Has numerous air sacs called alveoli to increase surface area for gaseous exchange;

Alveoli is moist to dissolve gases;

Alveoli surrounded by a single layer of epithelial cells to shorten diffusion distance for faster diffusion of gases;

Alveoli highly vascularised to carry away respiratory gases;

***First 3 (3mrks)***

Rej lungs are numerous. Must mention presence of alveoli.

ci) 1: Gill rakers; rej wrong spelling

rej singular

2: Gill bar;

3: Gill filaments; rej singular

ii) 1: Teethed/ forked to trap solid particles to protect the delicate gill filaments; (1 mrk)

3: Has numerous to increase surface area for gaseous exchange;

Moist to dissolve gases;

Surrounded by a single layer of epithelial cells to shorten diffusion distance for faster

diffusion of gases;

Highly vascularised to carry away respiratory gases;

***Any 1 (1 mrk)***