

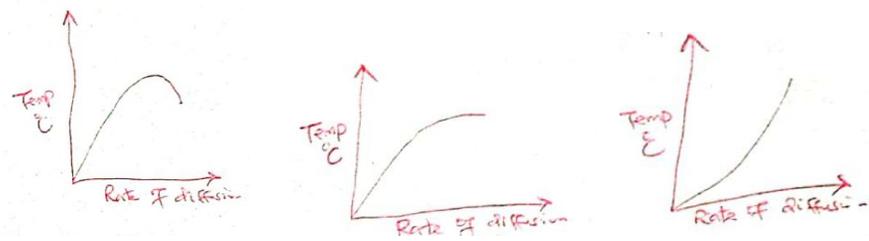
**231/1**  
**BIOLOGY**  
**PAPER 1**  
**MARKING SCHEME**  
**MARCH 2021**

**THE KENYA NATIONAL EXAMINATION COUNCIL**  
**KENYA CERTIFICATE OF SECONDARY EDUCATION**  
**BIOLOGY**  
**PAPER 1**

**MARKING SCHEME**  
**(CONFIDENTIAL)**

1. Species;
2. a) (Asexual) reproduction; Rej sexual  
b) Irritability / Response (to stimulus/sensitivity)
3. Form canopies/ shadows / Shade; which prevent light from reaching grass; grass die / fail to flourish due to their inability to photosynthesize.
4. - Cell wall is fully permeable while cell membrane is semi permeable (cell wall has larger pores while cell membrane has smaller pores)

- Cell wall is (mainly) made up of cellulose fibres while cell membrane has a (double) protein layer sandwiching a lipid layer; Acc Lipoprotein ;
  - Cell wall is rigid/tougher (cannot burst) while cell membrane is weaker (bursts);
- 5.
- a) Fungi; Acc fungi
  - b) Saprophytism/Saprophytic / food on dead decaying (organic) matter; Rej saprophyte
  - c) (i) Hypha; Hyphae ; Acc Mycellium, Rhizoids  
(ii) Secretes digestive enzymes (for external digestion);  
Anchors the organism / mushroom (firmly) onto the substrate; Acc. Anchorage)  
Absorbs digested food material/ Absorbs water and mineral salts/ ions;
6. Increases the surface area for (efficient) exchange / transport of respiratory gases (oxygen and carbon (iv) oxide) ;
7. Haemophilia; Acc Hemophilia
- 8.
- a)
 


  - b) The rate of diffusion increases with the increase in temperature; Increase in temperature increases the kinetic energy of the (diffusing) molecules (increasing the rate of diffusion)
- 9.
- a) Plants are less active than animals, hence require process;
  - b) During germination (to generate energy required for the process)  
During rapid growth/ cell division (at the tip of the roots/shoots)  
During active uptake / transport of substances (through the roots);
10. Waterlogging submerges the plant root system; cutting off supply of oxygen to the roots/ soil surrounding the roots; (aerobic) respiration in the roots is hampered; active uptake / transport of materials is affected (leading to the death of the affected plants);
- 11.
- |   |        |
|---|--------|
| K | Ulna   |
| L | Radius |

12. a) Rapid absorption of water by (germinating) seed through the micropyle / seed coat  
 b) During germination stored food in the endosperm is broken down /hydrolysed / oxidized; to provide nutrients for the growing embryo;
13. Presence of cones  
 Naked seeds/ seeds not enclosed in fruits  
 Xerophytic characteristics / needle like leaves / thick waxy cuticle / sunken stomata
14. a) Intermittent /stair case ( growth curve)  
 b) Arthropoda; correctly spelt, Acc arthropoda / Athropoda
15. a) Missing links due to complete decomposition of some organisms; Acc some parts decompose;  
 Distortion of parts during sedimentation  
 Destruction of fossils by geological activities (earthquakes/ faulting / mass movement of earth's surface / volcanicity  
 b) Presence of similar cell organelles (mitochondria, Ribosomes, lysosomes);  
 Similar biological chemicals ( ATP /Proteins/DNA); Similar blood pigmentation in tissues of some groups of animals show they have a common phylogenetic origin
16. a) Ovulation;  
 b) Follicle Stimulating Hormone Rj FSH/  
 Oestrogen / Estrogen  
 Luteinizing hormone Rj LH  
 c) Sickness  
 (Drastic) change in weather / environment;  
 Pregnancy / implantation/ conception rej fertilization;  
 Emotional instability (anger, stress, anxiety)
17. Renal artery branches directly from (dorsal) aorta whose blood under high pressure;  
 afferent arteriole / supplying blood is broader than efferent taking out blood;
18. a) Insulin  
 b) Pancreas  
 c) Diabetes mellitus
19. a) S Pepsin; Acc. Rennin, Chymosin  
 T Trypsin;  
 b) (i) Duodenum;  
 (ii) In the duodenum the medium is alkaline/basic; favouring the optimal working of the enzyme (T) as illustrated;
20. To completely kill/ contain the (targeted) pathogens; since failure to take full dose accords the pathogens an opportunity to develop resistance to the drug ; the pathogen mutates ( overtime) giving rise to new strains ; finally the drug becomes ineffective )

21. They lack ovaries  
Have small uterus  
Less number of chromosomes
22. a) A circular area seen (onstage) when focusing / viewing through the eye piece of a microscope  
b) Holds the revolving nose piece / objective lens in place ;  
Holds the ocular / eyepiece (lens) in place;  
c) To avoid rusting  
To avoid interference with the visibility of the lens;
23. Constrict during cold/ low temperature to conserve heat  
Dilate during hot/ high temperature ; to facilitate heat loss;
24. a) i) Juvenile ( hormone)  
ii) Prothoracic ( gland )  
b) Ecdysone (hormone) causes metamorphosis; or causes the larval stage (of an insect) to change / metamorphosize into pupa and pupa into adult;  
c) i) Complete metamorphosis;  
ii) During moulting ( the tough /hard impermeable) exoskeleton is shed; allowing the (soft permeable) larvae to take in air/water leading to rapid growth ( which in turn results to increase in size of the organism);

25. a)

Part	Adaptation
Cambium	Small cells with a dense cytoplasm to enable rapid mitotic division / giving rise to secondary growth;
Parenchyma	Have a thin wall for faster passage of materials ; Have large vacuole / irregular shape for storage / provide space for packing

- b) Sisal is a xerophyte) the thick cuticle enables it to conserve water reduce water loss; it is shiny to reflect light, minimizing evaporation by radiation.

26. The individuals blood has both antigens A and B; which will coagulate / agglutinate with antibodies a and b; found in individuals with blood groups A, B and O; OWTTE

27. a) i) Photosynthesis;  
ii) Starch;
- b) Respiratory enzyme s  
Absence/ Little oxygen
- c) Optimum temperature  
Light  
Water  
Moisture