

TEACHER.CO.KE
231/1/BIOLOGY
MARKING SCHEME – F4

1	Drought; Conservation of resources; Pollution; Food shortage; Poor health;	4
2	In aerobic respiration glucose is completely oxidized; releasing large amount of energy; while in anaerobic respiration, glucose is partially oxidized; releasing less energy	3
3	$\frac{1 \times 10 \times 100}{20} = 500 \text{ cells}$	3
4	(i) storage of the collected specimen(s); (ii) Attract and trap rodents;	
5	(a) <i>Vibrio cholerae</i> ; (b) Plasmodium species;	
6	Cells are large; Cells are actively dividing;	
7	a i) Diffusion; movement of solute molecules from high concentration to low concentration; ii) Active transport; movement of solute molecules from low concentration to high concentration / movement of solute molecules against a concentration gradient; b i) Potassium ion; ii) Metabolic poison stops respiration/energy production which is needed for active absorption of potassium ions;	
8	(a) hydrophyte; (1 mark) (b) Broad leaves provide large surface area for loss of excess water; Flowers are raised above the water to allow pollination; Leaves have chloroplasts that photosynthesize under low light intensity;	
9	(a) suffocation; (b) Vaseline blocks the spiracles; no inhalation;	
10	(i) formation of ATP; (ii) Production of hydrogen atoms;	
11	(a) blood entering lungs; (b) Blood entering the lungs has released oxygen to tissues and carbon (iv) oxide formed is added; blood leaving lungs has received oxygen and released carbon (iv) oxide;	
12	(a) capture recapture method; (b) $P = \frac{FM \times SC}{MR}$; $\frac{35 \times 2}{7}$ 200; (c) Beetles may migrate; Released beetles may not mix freely due to mark; Beetles may move in; Released beetles may not have enough time to mix; any 2	
13	i) hot water killed the fish; ii) Organic matter in sewage is decomposed; iii) oxygen is depleted causing suffocation and death;	

14	i) lowers the body tube through longer distances to bring the image into focus; ii) concentrates light onto the stage;	
15	(a) negative; (b) Glucagon;	
16	Starch/carbohydrates/glucose; fatty acids; amino acids; vitamins;	any 3
17	(a) i 0/3 c 0/1 pm 3/3 m3/3; (b) Herbivorous; (c) Absence of upper incisors; Absence of upper canines;	
18	a) i) Semilunar valves; ii) Aorta; b) $\frac{0.4838 \times 100}{0.59} = 82 \text{ kg}$ (2mks)	
19	Constriction/ narrowing / shunt effect of arteriole; less blood flow to capillaries reduces heat loss; through radiation/conduction/convection;	
20	a i) The chromosomes attach themselves through centromere to facilitate their division; ii) Formation of spindle fibres; b) Facilitates cross pollination; resulting in variation/ hybrid vigour	
21	cytology is the study of cells while entomology is the study of insects;	
22	(i) stimulates synthesis of sperms; (ii) stimulates the interstitial cells to release male hormones;	
23	Has green pigment chlorophyll; that traps light energy;	
24	(a) Animal; (b) Hook like structures that stick onto fur/hair of animals;	
25	a) Enables them to survive unfavourable weather conditions through the pupa stage Random dispersal of various stages prevents overcrowding competition b) pests eg weevils and stalk borers destroy food crops/products; termites destroy timber for construction vectors eg mosquitoes and tsetse fly transmit disease causing microorganisms houseflies contaminate food with dirt and disease pathogens for cholera, typhoid etc	
26	Protects the delicate plumule from mechanical damage as it emerges from the ground	
27	a) Transmission of one pair of contrasting characteristics b) Genotype-genetic constitution of an organism Phenotype-physical /outward appearance of an organism	

