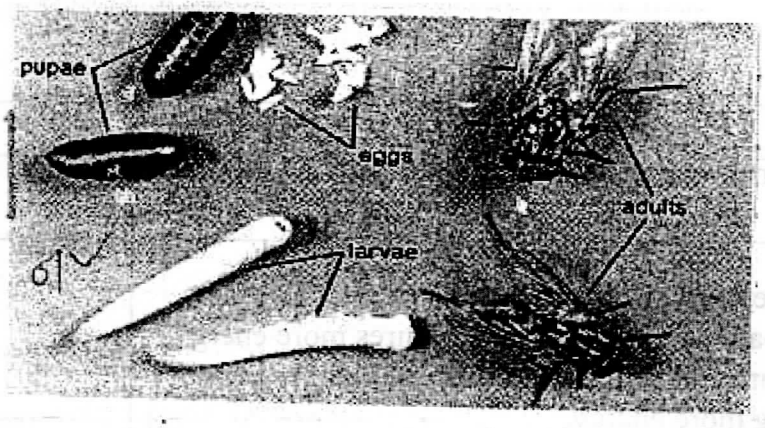
4.5 BIOLOGY (231)

4.5.1 Biology Paper 1 (231/1)

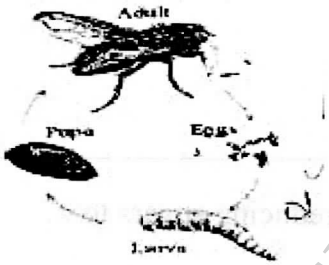
1	a) Pooter/Aspirator;	(1 mark)
	b) To prevent dirt/insects from entering the suction tube/into the mouth;	(1 mark)
2	(a) (i) F - Kidney; G - Bladder/Ureter/Urethra; ii) Kidney - active re-absorption of solutes requires more energy; organelle F has more cristae for attachment of more respiratory enzymes producing more energy; Bladder/ureter/urethra does not require as much energy/ organelle G has less number of cristae hence fewer respiratory enzymes attached/less energy produced; (b) i) Stroma; ii) Grana/granum;	(1 mark) (1 mark) (2 marks) (1 mark) (1 mark)
3	a) Non reducing sugar; b) (i) Hydrolyze/break down sucrose/ non reducing sugars to reducing sugars/glucose/fructose; (ii) neutralize the acid;	(1 mark) (1 mark) (1 mark)
4	a) R.Q = $\frac{CO_2 \text{ produced}}{O_2 \text{ consumed}}$; $= \frac{199.75}{200}$ $= 0.99875$; b) Carbohydrates/glucose; c) -Stored in the body as fat/subcutaneous deposit/adipose tissue; -Stored as glycogen (in the liver / muscle cells); -(Increase) oxidation; any 2-	(2 marks) (1 mark) (2 marks)

5 (a) (i)



(1mark)

(ii)



(1mark)

b (i)

Housefly	Cockroach
- Undergo complete metamorphosis/Egg, Larva,Pupa,Adult/has 4 steps; - Eggs have no egg case/ ootheca - Many/numerous eggs	- Undergoes incomplete metamorphosis/ Egg,Nymph,Adult/has 3 steps; - Eggs in egg case/ootheca - Fewer eggs

(2 marks)

2×1

ii) Absence of larva and pupa shortens the life cycle of the organism; (avoiding adverse/extreme environmental conditions that would affect its growth/general life processes); (1mark)

6 Pepsin (secreted as pepsinogen);
Trypsin (secreted as trypsinogen);
Rennin/chymosin (Secreted as Prorennin/Prochymosin; max-2 (2 marks)

7
- Animal - accept correct examples (of organisms)/amoeba/ plasmodium;
- Constriction of the cell membrane/ presence of centrioles ; (2 marks)

8	To increase the supply of oxygen (in the tissues); to offset the "oxygen debt"/halt/manage the accumulation of lactic acid (in the muscles);	(2 marks)
9	a) Reflects light (through the condenser) to the object; b) - Can break the objective lens/cover slip/slide; - Can destroy the specimen (making the microscope dirty);	(1 mark) Any one correct (1 mark)
10	a) The diaphragm contracts and flattens; leading to increase in volume of the thoracic cavity; decreasing the pressure inside it, (forcing in the air); b) -Thin leaf lining/epidermis for faster diffusion of respiratory gases/ to reduce diffusion distance for respiratory gases; -Numerous stoma to increase surface area for gaseous exchange; - loosely packed cells in the spongy mesophyll region/ intercellular air spaces (lower layer) to allow for free movement of respiratory gases;	(3 marks) Any 2 (2 marks)
11	a i) Diffusion; ii) - Gaseous exchange/excretion of carbon (IV) oxide and oxygen; - Translocation of materials; - Absorption/uptake of mineral ions/salts; b. - Lowering the temperature of the medium; - Increasing thickness of the membrane; - Use less dye/add more water/reducing the concentration gradient;	(1 mark) Any 2 (2 marks) (2 marks)
12	a) Geotropism - enables plants access water/mineral salts; - Anchorage; b) Phototropism- Exposes plant leaves to light for photosynthesis/for formation of chlorophyl;	(2 marks) (1 mark)
13	*Mycobacterium tuberculosis/ Mycobacterium bovis;*	(1 mark)
14	a. Epigeal; b. G – Elongates to expose the foliage leaves to light photosynthesis H - Stores food (for growth); - For photosynthesis (it is green); - Protects plumule during germination;	(1 mark) (1 mark) Any one (1 mark)
15	Osmosis; water moves into the cells becoming turgid; attaining mechanical support ; OWTTE	(3 marks)

16	a. I – Deletion; II- Inversion; b. The characteristics /traits of an organism are determined by internal factors/ genes (which occur in pairs). Only one of the genes can be carried in a gamete/ passed onto the next generation; c. – Most have lost most of the original (desirable) qualities eg taste; - Poor/undesirable qualities are perpetuated through subsequent generations; - Products' qualities are irreversible- can't get original species/qualities;	(1 mark) (1 mark) (1 mark) Any 2 (2 marks)
17	- Presence of numerous villi/microvilli; - Being long; - Being highly coiled;	Any 2 (2 marks)
18	a. Comparative embryology; b. Fish remained in the aqueous media/ aquatic habitat; well-developed tail/ fin for propulsion/movement; -Ability to rationalize / higher thinking capacity/higher brain activity/advanced brain; -Ability to walk on two's/ bipedal modification of the limbs/ opposable thumbs/upright posture; -Communicate through speech; -Have binocular/stereoscope vision;	(1 mark) (2 marks) (2 marks)
19	a. i) Less water and urea; since some is excreted/eliminated through the skin (as sweat); ii) increased amount of urea in the urine; due to deamination of amino acids (from proteins);	(2 marks) (2 marks)
	b. i) ultra filtration; ii) Selective reabsorption;	(1 mark) (1 mark)
20	i. Petrification/change into rock; ii. Entire organism or parts preserved; iii. Impressions (eg casts/moulds);	(3 marks)
21	Differences in distribution of chlorophyll/leaf is variegated; green patches would photosynthesize forming starch; giving blue-black colour with iodine solution unlike the regions without chlorophyll;	(3 marks)

22	- Storage in tissues in non-toxic forms; - Deposited in plant tissues/organs- which age and fall off; (eg leaves, bark, fruits, flowers)	(2 marks)
23	a. i) To investigate how ants respond to moisture/water/ hydrotaxis (varied environments with/without moisture/ water); ii) Silica gel/anhydrous calcium chloride pellets/pyrogallic acid/dehydrating/ drying agent; iii) The colour of cobalt (II) chloride paper remained blue/all the moisture/ water vapour was absorbed/There was no water/moisture in the flask to change the colour of cobalt (II) chloride paper; b. (More) ants were attracted/ moved into the flask; due to the presence of moisture/water vapour; (evidenced by the change of cobalt (II) chloride paper to pink)	(1 mark) (1 mark) (1 mark) (1 mark) (2 marks)