

QUESTIONSHEET 1

Kingdom	Features	Examples
Fungi	eukaryotic heterotrophic consists of hyphae chitinous cell walls ;	mushrooms Penicillium Mucor ;
Protoctista	eukaryotic heterotrophic (some) autotrophic (some) unicellular or groups of similar cells ;	Amoeba green algae malarial parasite ;
Plantae	eukaryotic autotrophic multicellular cellulosic cell walls ;	moss ferns dicotyledons ;
Animalia	eukaryotic heterotrophic multicellular have nervous coordination ;	tape worm spider frog ;

(a) 1 mark per box with three correct features and no incorrect features.

4

(b) 1 mark per box with two correct examples and no incorrect example.

4

TOTAL 8

QUESTIONSHEET 2

There are numerous ways of doing the key. The following is an example only.

- | | |
|---|-----------|
| 1. insect has 1 pair of wings | go to 3 |
| 2. insect has 2 pairs of wings | go to 5 |
| 3. abdomen has 4 segments | Species A |
| 4. abdomen has 7 segments | Species B |
| 5. antennae clubbed | Species D |
| 6. antennae not clubbed | got to 7 |
| 7. wings small in area relative to body | go to 9 |
| 8. wings much larger than body | Species E |
| 9. abdomen/body is thin | Species F |
| 10 abdomen/body is thick | Species C |

Use of a truly dichotomous key;

1

1 mark per species correctly separated;;;;;

6

TOTAL 7

QUESTIONSHEET 3

- 1. leaves simple/not divided go to 3
- 2. leaves compound/divided into leaflets go to 11
- 3. leaves spear/lance shaped/isobilateral. go to 5
- 4. leaves with broad lamina/dorsi-ventral go to 7
- 5. leaf rolled/curled leaf D
- 6. leaf flat leaf C
- 7. leaf with smooth margin leaf E
- 8. leaf with shaped margin go to 9
- 9. margin lobed leaf A
- 10. margin serrated leaf F
- 11. leaflets all arise from tip of petiole leaf G
- 12. leaflets arise along side of petiole go to 13
- 13. leaflets arise opposite to each other. leaf B
- 14. leaflets arise alternately/not opposite leaf H

Allow one mark for each leaf correctly separated;;;;;;;

8

Allow one mark for a correct dichotomous key;

1

Accept alternative keys if correct and alternative wordings if clear.

TOTAL 9

QUESTIONSHEET 4

(a) (i) all possess jointed legs;

1

(ii)

Insecta	Crustacea	Arachnida	Chilopoda (Myriapoda)
head louse bee wax moth crane fly ;		harvestman spider ;	centipede ;

3

- (b) 1. organism has wings go to 3
- 2. organism wingless go to 7
- 3. organism with one pair of wings crane fly
- 4. organism with two pairs of wings go to 5
- 5. wings smaller than body/short antennae bee
- 6. wings larger than body/long antennae wax moth
- 7. has three pairs of legs head louse
- 8. has more than three pairs of legs go to 9
- 9. has many legs centipede
- 10. has four pairs of legs go to 11
- 11. body in one part harvestman
- 12. body in two parts spider

1 mark per organism correctly identified;;;;;;;

7

1 mark for correct dichotomy;

1

QUESTIONSHEET 5

- (a) (i) Kingdom - Phylum - Class - Order - Family - Genus - Species; 1
- (ii) fungi are saprophytic/non-photosynthetic, plantae are photosynthetic;
fungal cell/hyphae walls do not contain cellulose, plant cell walls do;
fungi do not contain chlorophylls, plant cells do;
fungi have multinucleate hyphae, plants have cells with single nuclei; max 2
- (iii) protocista have nuclear membranes, prokaryotae do not;
protocista have chromosomes, prokaryotae have a single chromosome/ nuclear mass;
protocista have membrane bound organelles/mitochondria or other example, prokaryotae do not; max 2
- (b) (i) body in three parts/head + thorax + abdomen;
three pairs of legs;
compound eyes;
one pair of antennae;
thorax has three segments;
any other valid feature; max 3
- (ii) A has two pairs of wings, C has one pair and B is wingless;
A has a very narrow 'waist', C has a thicker 'waist' and B has no 'waist';
A has a long sting/ovipositor, C has a short sting/ovipositor and B does not have one; max 2
- (c) (i) a flea; 1
- (ii) elongated/powerful back legs for jumping; 1
- (iii) plague/bubonic plague; 1
- TOTAL 13**

QUESTIONSHEET 6

- (a) (i) A = plasma membrane; B = cell wall; C = nuclear mass; D = mesosome; E = ribosomes; 5
- (ii) contain the enzymes for respiration/cell wall synthesis; 1
- (iii) coccus; 1
- (b) (i) prokaryotic cells contain no membrane-bound organelles, eukaryotes do;
prokaryote cells have no nuclear membrane, eukaryotes do/prokaryotes have a nuclear mass, eukaryotes have a nucleus/prokaryotes have one long chromosome, eukaryotes have many chromosomes;
prokaryotes have no nucleoli, eukaryotes do;
prokaryotic cell walls contain murein, eukaryotic cell walls (if present) contain cellulose; max 3
- (ii) Nostoc is prokaryotic but algae are eukaryotic; 1
- (iii) in the cytoplasm/in vesicles/in chromatophores; 1
- TOTAL 12**

QUESTIONSHEET 7

Feature	Viruses	Bacteria	Algae	Protozoa	
Cannot reproduce independently	✓	✗	✗	✗	;
Are heterotrophic	✗	✓	✗	✓	;
Can cause diseases	✓	✓	✗	✓	;
Contain DNA or RNA but not both	✓	✗	✗	✗	;
Can photosynthesise	✗	✓ (some species can)	✓	✗	;

5

TOTAL 5**QUESTIONSHEET 8**

- (a) (i) A = radial; B = bilateral; C = radial; D = radial; E = bilateral; F = bilateral; **6**
- (ii) can receive/obtain food (with equal ease) from any direction;
can receive sperm/gametes (with equal ease) from any direction;
can receive stimuli from all directions/has 'all round' awareness; **max 2**
- (iii) has an equal chance of receiving/attracting an insect from any direction;
can shed seeds/fruits equally well in all directions; **max 1**
- (b) (i) has jointed legs; **1**
- (ii) body in three parts/head, thorax, abdomen;
has compound eyes;
has 1 pair of antennae;
has three pairs of legs; (reject wings, some insects are wingless) **max 2**
- (c) (i) webbed (hind) feet;
moist skin/skin used as respiratory surface;
must return to water to breed;
has an aquatic tadpole larva; **max 2**
- (ii) nectar (to attract insects);
coloured/red/white (to attract insects);
petals/corolla provides a landing stage (for insects); **max 2**

TOTAL 16

QUESTIONSHEET 9

- (a) (i) some lengths of DNA strands will not have complementary bases;
thus will not be joined by hydrogen bonds/double helix held together by fewer hydrogen bonds;
thus less energy required to split strands apart; **max 2**
- (ii) the further subspecies diverge the more discrepancies occur between complementary bases;
thus fewer hydrogen bonds anchor the DNA strands in hybrid DNA of distant subspecies; **max 2**
- (iii) greatest differences in separation temperatures of Nigerian group and other three subspecies;
suggesting that they are fairly divergent groups/Nigerian group may be a separate subspecies;
Nigerian group is probably genetically closest to Pan troglodytes verus;
Pan troglodytes troglodytes is probably closest to Pan troglodytes schweinfurthei;
(accept any other reasonable comments) **max 3**
- (b) (i) whether DNA fingerprints of different organisms show corresponding dark bands;
these indicate matching/corresponding base/nucleotide sequences;
ref to visualisation by radioactive gene probes, labelled sequences show up as dark bands on film; **max 2**
- (ii) 1. Pan troglodytes troglodytes and Pan troglodytes schweinfurthei; **2**
2. Pan troglodytes schweinfurthei and the Nigerian group;
- TOTAL 11**
-

QUESTIONSHEET 10

- (a) (i) has nervous coordination;
is non-photosynthetic/heterotrophic; **2**
- (ii) has a notochord;
has a dorsal hollow nerve cord;
has visceral clefts;
has a post-anal tail; **max 2**
- (iii) has skin with hair in follicles;
viviparous/has gestation periods/young born from uterus;
has mammary glands/young fed on milk; **max 2**
- (iv) only eats meat/ref to dentition; **1**
- (b) (i) dog family/Canidae/bear family/Ursidae/any other correct example; **1**
- (ii) Leo/lion genus/Felis/domestic cat genus/any other correct example; **1**
- (c) the classification represents the evolutionary history/evolutionary affinities of organisms;
the closer two types of organisms are in the classification the closer their evolutionary relationship; **2**
- TOTAL 11**

QUESTIONSHEET 11

- (a) tapeworms are parasites inside gut/other organs/endoparasites;
hooks and suckers enable their heads to attach (strongly) to host organs; **2**
- (b) 1. head with no hooks/suckers only go to 3
2. head with hooks and suckers go to 5
3. head with two simple suckers species A
4. head with four leaf like suckers (and four simple suckers) species D
5. head with one row of hooks go to 7
6. head with more than one row of hooks go to 9
7. hooks small, three large suckers visible/four large suckers species E
8. hooks large, two small suckers and two large suckers visible species C
9. two rows of small hooks, three large suckers visible/four large suckers species B
10. two groups of hooks on head, many hooks on 'neck', two large suckers species F
- 1 mark for each correct identification = 6 marks;;;;;
1 mark for a correct dichotomous key; **7**

TOTAL 9**QUESTIONSHEET 12**

- (a) lack nuclear membranes/organised nuclei;
lack membrane bound organelles;
lack 9 + 2 microtubule organelles; **max 2**
- (b) have multinucleate hyphae;
no cellulose in walls/have chitin rather than cellulose;
heterotrophic nutrition by direct absorption/extracellular digestion;
have spores without flagella; **max 2**
- (c) cell walls contain cellulose;
multicellular photosynthetic eukaryotes; **2**
- (d) monocotyledons have only one seed leaf, dicotyledons have two;
monocotyledons have leaves with parallel veins, dicotyledons have leaves which are net-veined;
monocotyledons have floral parts in threes, dicotyledons have floral parts in fives (usually) **max 2**
- (b) all contain a notochord (at some stage);
all have a dorsal, hollow nerve cord;
all have visceral clefts;
all have a post-anal tail; **max 2**
- (c) all have skin with hair follicles;
all are viviparous/young born from uterus/have pregnancies;
young are fed on milk/have mammary glands/suckle young; **max 2**

TOTAL 12