Year 7 Cells and Microscopes Worksheet - Mark Scheme

Year 7 · KS3 Biology · Cells, microscopes and specialised cells

Section A: Cell parts and their jobs [20 marks]

1(a)	nucleus	**1**
1(b)	cytoplasm	**1**
1(c)	cell membrane	**1**
1(d)	cell wall	**1**
1(e)	chloroplasts	**1**
1(f)	mitochondria Guidance: Respiration releases energy in mitochondria.	**1**
2	Nucleus: Yes, Yes. Cell membrane: Yes, Yes. Cytoplasm: Yes, Yes. Cell wall: No, Yes. Chloroplasts: No, Yes (in the green parts). Large permanent vacuole: No, Yes. Mitochondria: Yes, Yes. Guidance: 1 mark for each correct box (14 boxes).	**14**

Section B: Using a microscope [16 marks]

3	Eyepiece lens; stage; light source (lamp or mirror); coarse focusing wheel; objective lens. Guidance: 1 mark each.	**5**
4(a)	10 × 40 = ×400	**2**
4(b)	×40	**1**
4(c)	×4 (the lower power lens shows a larger field of view)	**1**
5	D, B, C, A, E Guidance: 3 marks for fully correct; 2 marks if one pair swapped; 1 mark if B before C and A before E.	**3**
6	It gives the widest field of view so the specimen is easier to find (1). It stops the objective lens hitting or breaking the slide (1).	**2**
7	(a) 500 µm (1) (b) 2.5 mm (1)	**2**

Section C: Plant cells, animal cells and specialised cells [15 marks]

8	Any three: plant cells have a cell wall, animal cells do not; plant cells have chloroplasts, animal cells do not; plant cells have a large permanent vacuole, animal cells do not; plant cells are usually regular or rectangular in shape, animal cells are usually rounder or irregular. Guidance: 1 mark each. A difference must mention both cell types.	**3**
9(a)	Chloroplasts contain chlorophyll that absorbs light (1) so the cell can make more glucose by photosynthesis (1).	**2**
9(b)	The cell wall is made of cellulose and is strong (1) so it supports the cell and keeps its shape (1).	**2**

10	Red blood cell: contains haemoglobin / no nucleus / biconcave shape. Root hair cell: long hair gives a large surface area. Sperm cell: tail to swim / many mitochondria for energy. Nerve cell: long and thin to carry signals over long distances. Palisade cell: many chloroplasts. Guidance: 1 mark for each correct feature linked to the job.	**5**
11(a)	cell, tissue, organ, organ system, organism	**2**
11(b)	Digestive system	**1**

Section D: Practical skills and calculations [11 marks]

12(a)	It stains the cells so the cell parts are easier to see.	**1**
12(b)	To avoid trapping air bubbles.	**1**
12(c)	60 ÷ 0.3 (1) = ×200 (1) Guidance: Allow 1 mark for correct substitution.	**2**
12(d)	Any two: use a sharp pencil; clear single lines; no shading or colouring; label lines drawn with a ruler and not crossing; drawing is large enough to fill the space; title and magnification shown. Guidance: 1 mark each.	**2**
13	4 cm = 40 mm (1); 40 ÷ 400 = 0.1 mm (1); 0.1 × 1000 = 100 µm (1)	**3**
14	Mitochondria release energy by respiration (1) so the sperm can swim (to the egg) (1).	**2**

Total: 62 marks. Accept any scientifically correct alternative wording.