MARK SCHEME

Total: 41 marks

Q	Answer	Marks
SECTION A – Key Words (11 marks)		
1	Ecology → the study of living organisms and the places they live in Food chain → a list of organisms that shows their feeding relationships Producer → an organism that makes its own food by photosynthesis Trophic level → a stage (feeding level) in a food chain Herbivore → an animal that eats plants only Omnivore → an animal that eats both plants and animals	**6** (1 each)
2	a) producer b) algae c) photosynthesis d) energy e) carnivore *(herbivore and respiration are not used)*	**5**
SECTION B – Food Chains (15 marks)		
3a	Grass = producer; Rabbit = primary consumer; Fox = secondary consumer	**3**
3b	3 (three trophic levels)	**1**
3c	The transfer / flow of **energy** (in food) from the food to the feeder. *Accept: what eats what / direction of energy flow.*	**1**
3d	The **Sun** (light energy, used in photosynthesis)	**1**
4a	oak leaves → caterpillar → blue tit → sparrowhawk *1 mark for correct order; 1 mark for arrows pointing the right way (food → feeder).*	**2**
4b	Sparrowhawk	**1**
5	Herbivore: Cow, Deer | Carnivore: Lion, Shark | Omnivore: Bear, Human	**6** (1 each)
SECTION C – Energy Transfer (15 marks)		
6	10% (about / around 10%)	**1**
7a	20 000 × 10 ÷ 100 (or 20 000 ÷ 10) = **2 000 kJ** *1 mark for working, 1 mark for correct answer.*	**2**
7b	2 000 × 10 ÷ 100 (or 2 000 ÷ 10) = **200 kJ** *Allow error carried forward from 7a.*	**2**
8	Any **three** from: • movement • respiration / transferred to the environment as heat • waste materials, e.g. faeces and urine • some parts of the organism are not eaten (e.g. bones, roots) • used for cell growth / repairing damaged cells	**3**
9	1. False 2. True 3. False 4. True	**4** (1 each)
10	Any three points from: • only about 10% of energy is passed on at each level / 90% is lost • so there is less and less energy available at each level • after 4–5 levels there is not enough energy left to support another level / another animal • so there are fewer organisms at higher trophic levels	**3**