3.10 Biology: Plants, Ecology and Health: 2-hour Pack

ISEB Common Entrance Biology (13+) · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 5 quadrats, each of area 0.25 m², are placed at random in a field. The numbers of snails counted are 8, 6, 9, 5, 7. Calculate the mean number per m2.

- ☐ A) 35 per m2
- ☐ B) 1.75 per m2
- ☐ C) 28 per m2
- ☐ D) 112 per m2
- ☐ E) 7 per m2

---

2 Which of these is a decomposer?

- ☐ A) rabbit
- ☐ B) fox
- ☐ C) fungus
- ☐ D) grass
- ☐ E) oak tree

---

3 In the food chain algae -> water flea -> minnow -> pike, which organism is the producer?

- ☐ A) cabbage
- ☐ B) algae
- ☐ C) phytoplankton
- ☐ D) snail
- ☐ E) caterpillar

© Revision Library | revisionlibrary.co.uk

4 Which part of a flower is responsible for containing the female gamete and becoming the seed after fertilisation?

- [ ] A) filament
- [ ] B) ovary
- [ ] C) stigma
- [ ] D) ovule
- [ ] E) petals

---

5 Which of these animals is one of the crustaceans?

- [ ] A) crab
- [ ] B) slug
- [ ] C) ant
- [ ] D) scorpion
- [ ] E) mite

---

6 Which of these animals is one of the amphibians?

- [ ] A) human
- [ ] B) goldfish
- [ ] C) penguin
- [ ] D) cod
- [ ] E) salamander

---

7 A wheat field contains grain with a total energy content of 15,000 kJ. The mice that eat this grain contain a total of 900 kJ of energy. Calculate the percentage of energy transferred from the grain to the mice.

(1)

© Revision Library | revisionlibrary.co.uk

8 In a woodland, the producers in a food chain store 10000 kJ of energy. 15% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 150000 kJ
- [ ] B) 1500 kJ
- [ ] C) 15000 kJ
- [ ] D) 150 kJ
- [ ] E) 8500 kJ

---

9 5 quadrats, each of area 0.25 m^2, are placed at random in a field of area 400 m^2. The numbers of daisies counted are 8, 9, 11, 10, 12. Estimate the total number of daisies in the field.

- [ ] A) 80000
- [ ] B) 1000
- [ ] C) 40
- [ ] D) 4000
- [ ] E) 16000

---

10 Which type of joint is found at the knee and the elbow?

- [ ] A) ball and socket joint
- [ ] B) gliding joint
- [ ] C) fixed joint
- [ ] D) hinge joint
- [ ] E) pivot joint

---

11 In the food chain grass -> grasshopper -> frog -> heron, which organism is the primary consumer?

- [ ] A) grasshopper
- [ ] B) kestrel
- [ ] C) oak leaf
- [ ] D) aphid
- [ ] E) pondweed

© Revision Library | revisionlibrary.co.uk

12 Which part of a flower is responsible for receiving pollen?

- [ ] A) sepals
- [ ] B) filament
- [ ] C) stigma
- [ ] D) style
- [ ] E) anther

---

13 What do decomposers do to dead plants and animals?

- [ ] A) make them grow faster
- [ ] B) break them down and return nutrients to the soil
- [ ] C) turn them into fossils
- [ ] D) store them as fat
- [ ] E) use them to make sunlight

---

14 In the food chain nettle -> aphid -> ladybird -> thrush, which organism is the producer?

- [ ] A) limpet
- [ ] B) lion
- [ ] C) leopard seal
- [ ] D) nettle
- [ ] E) fox

---

15 Which of these animals is one of the crustaceans?

- [ ] A) mite
- [ ] B) butterfly
- [ ] C) lobster
- [ ] D) scorpion
- [ ] E) leech

---

16 Which of these animals is NOT one of the reptiles?

- [ ] A) eagle
- [ ] B) lizard
- [ ] C) snake
- [ ] D) tortoise
- [ ] E) crocodile

© Revision Library | revisionlibrary.co.uk

17 A teenage boy needs 2,200 kcal daily. Over one day he consumes: breakfast 480 kcal, lunch 620 kcal, dinner 950 kcal, snacks 80 kcal. Calculate the difference between his intake and requirement, and state whether he is in balance, surplus or deficit.

(1)

---

18 In a meadow, the producers in a food chain store 100000 kJ of energy. 15% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 150000 kJ
- [ ] B) 1500000 kJ
- [ ] C) 1500 kJ
- [ ] D) 85000 kJ
- [ ] E) 15000 kJ

---

19 5 quadrats, each of area 1 m², are placed at random in a field. The numbers of snails counted are 4, 7, 3, 6, 5. Calculate the mean number per m2.

- [ ] A) 25 per m2
- [ ] B) 5 per m2
- [ ] C) 0.5 per m2
- [ ] D) 6.25 per m2
- [ ] E) 50 per m2

---

20 What do we call all the living things in a habitat?

- [ ] A) population
- [ ] B) habitat
- [ ] C) ecosystem
- [ ] D) species
- [ ] E) community

© Revision Library | revisionlibrary.co.uk

21 In the food chain clover -> mouse -> owl, which organism is the primary consumer?

- [ ] A) penguin
- [ ] B) pondweed
- [ ] C) sparrowhawk
- [ ] D) mouse
- [ ] E) water flea

---

22 Which of these animals is one of the insects?

- [ ] A) bee
- [ ] B) octopus
- [ ] C) earthworm
- [ ] D) woodlouse
- [ ] E) ragworm

---

23 To which group of vertebrates does a crocodile belong?

- [ ] A) amphibians
- [ ] B) birds
- [ ] C) reptiles
- [ ] D) fish
- [ ] E) mammals

---

24 A pond contains algae with a total energy content of 50,000 kJ. Small fish that feed on the algae contain 2,500 kJ of energy. Calculate the percentage of energy transferred from algae to the fish.

(1)

---

25 In a meadow, the producers in a food chain store 2000 kJ of energy. 5% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 10000 kJ
- [ ] B) 1000 kJ
- [ ] C) 100 kJ
- [ ] D) 400 kJ
- [ ] E) 1900 kJ

© Revision Library | revisionlibrary.co.uk

26 5 quadrats, each of area 1 m², are placed at random in a field. The numbers of buttercups counted are 8, 9, 6, 5, 7. Calculate the mean number per m2.

- [ ] A) 35 per m2
- [ ] B) 70 per m2
- [ ] C) 0.7 per m2
- [ ] D) 8.75 per m2
- [ ] E) 7 per m2

---

27 Which part of the body controls the whole body and is protected by the skull?

- [ ] A) brain
- [ ] B) heart
- [ ] C) liver
- [ ] D) lungs
- [ ] E) kidneys

---

28 In the food chain grass -> zebra -> lion, which organism is the top predator?

- [ ] A) grass
- [ ] B) zebra
- [ ] C) algae
- [ ] D) lion
- [ ] E) cabbage

---

29 Which of these animals is NOT one of the arachnids?

- [ ] A) tick
- [ ] B) leech
- [ ] C) scorpion
- [ ] D) spider
- [ ] E) mite

© Revision Library | revisionlibrary.co.uk

30 Which of these animals is one of the reptiles?

- [ ] A) herring
- [ ] B) ostrich
- [ ] C) sparrow
- [ ] D) lizard
- [ ] E) goldfish

---

31 A balanced diet contains several nutrients. Name one nutrient that is important for energy release during cellular respiration.

(1)

---

32 In a woodland, grass stores 100000 kJ of energy and the rabbits that eat it store 8000 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- [ ] A) 92000%
- [ ] B) 8%
- [ ] C) 0.08%
- [ ] D) 1250%
- [ ] E) 92%

---

33 5 quadrats, each of area 0.25 m^2, are placed at random in a field of area 100 m^2. The numbers of snails counted are 11, 13, 10, 12, 14. Estimate the total number of snails in the field.

- [ ] A) 1200
- [ ] B) 300
- [ ] C) 24000
- [ ] D) 48
- [ ] E) 4800

---

34 Which bones protect the heart and lungs?

- [ ] A) ribs
- [ ] B) skull
- [ ] C) femur
- [ ] D) vertebrae
- [ ] E) pelvis

© Revision Library | revisionlibrary.co.uk

35 In the food chain grass -> zebra -> lion, what does the arrow show?

- [ ] A) which organisms compete
- [ ] B) what each organism lives in
- [ ] C) the direction of energy flow
- [ ] D) which organism is bigger
- [ ] E) the direction the animals move

---

36 Which of these animals is NOT one of the annelids (segmented worms)?

- [ ] A) ragworm
- [ ] B) mite
- [ ] C) earthworm
- [ ] D) leech
- [ ] E) lugworm

---

37 Which of these animals is one of the reptiles?

- [ ] A) dolphin
- [ ] B) cod
- [ ] C) dog
- [ ] D) herring
- [ ] E) crocodile

---

38 A food chain starts with wheat (20,000 kJ energy). Mice eat the wheat and contain 1,600 kJ. Calculate the percentage of energy transferred to the mice.

(1)

---

39 In a pond, grass stores 5000 kJ of energy and the rabbits that eat it store 600 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- [ ] A) 120%
- [ ] B) 0.12%
- [ ] C) 12%
- [ ] D) 4400%
- [ ] E) 88%

© Revision Library | revisionlibrary.co.uk

40 5 quadrats, each of area 0.25 m², are placed at random in a field. The numbers of daisies counted are 12, 11, 14, 10, 13. Calculate the mean number per m2.

- [ ] A) 48 per m2
- [ ] B) 192 per m2
- [ ] C) 60 per m2
- [ ] D) 12 per m2
- [ ] E) 3 per m2

---

41 Which structure in the nucleus carries the genetic information?

- [ ] A) ribosomes
- [ ] B) vacuoles
- [ ] C) mitochondria
- [ ] D) chromosomes
- [ ] E) chloroplasts

---

42 In the food chain grass -> zebra -> lion, which organism is the secondary consumer?

- [ ] A) dragonfly larva
- [ ] B) lion
- [ ] C) clover
- [ ] D) owl
- [ ] E) water flea

---

43 To which group of invertebrates does a butterfly belong?

- [ ] A) arachnids
- [ ] B) annelids (segmented worms)
- [ ] C) molluscs
- [ ] D) crustaceans
- [ ] E) insects

© Revision Library | revisionlibrary.co.uk

44 Which of these animals is one of the birds?

- ☐ A) ostrich
- ☐ B) lizard
- ☐ C) salmon
- ☐ D) whale
- ☐ E) newt

---

45 When a tree falls in a forest, it gradually rots and breaks down on the forest floor. Name the group of organisms mainly responsible.

(1)

---

46 In a pond, the producers in a food chain store 1000 kJ of energy. 20% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- ☐ A) 2000 kJ
- ☐ B) 20000 kJ
- ☐ C) 200 kJ
- ☐ D) 800 kJ
- ☐ E) 50 kJ

---

47 5 quadrats, each of area 1 m^2, are placed at random in a field. The numbers of clover plants counted are 1, 5, 4, 3, 2. Calculate the mean number per m2.

- ☐ A) 0.3 per m2
- ☐ B) 30 per m2
- ☐ C) 15 per m2
- ☐ D) 3 per m2
- ☐ E) 3.75 per m2

---

48 Which type of reproduction involves only one parent?

- ☐ A) fertilisation
- ☐ B) sexual reproduction
- ☐ C) germination
- ☐ D) asexual reproduction
- ☐ E) pollination

© Revision Library | revisionlibrary.co.uk

49 In the food chain grass -> grasshopper -> frog -> heron, which organism is the tertiary consumer?

- ☐ A) slug
- ☐ B) limpet
- ☐ C) heron
- ☐ D) leopard seal
- ☐ E) greenfly

---

50 Which of these animals is one of the molluscs?

- ☐ A) tick
- ☐ B) shrimp
- ☐ C) ant
- ☐ D) bee
- ☐ E) mussel

---

51 To which group of vertebrates does a newt belong?

- ☐ A) mammals
- ☐ B) amphibians
- ☐ C) reptiles
- ☐ D) birds
- ☐ E) fish

---

52 A pond contains algae with a total energy content of 10,000 kJ. The water fleas that eat this algae contain a total of 900 kJ of energy. Calculate the percentage of energy transferred from the algae to the water fleas.

(1)

© Revision Library | revisionlibrary.co.uk

53 In a woodland, grass stores 1000 kJ of energy and the rabbits that eat it store 150 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- [ ] A) 15%
- [ ] B) 0.15%
- [ ] C) 850%
- [ ] D) 85%
- [ ] E) 150%

---

54 5 quadrats, each of area 1 m², are placed at random in a field. The numbers of buttercups counted are 5, 6, 4, 8, 7. Calculate the mean number per m2.

- [ ] A) 6 per m2
- [ ] B) 30 per m2
- [ ] C) 0.6 per m2
- [ ] D) 7.5 per m2
- [ ] E) 60 per m2

---

55 Which scientist is known for the theory of evolution by natural selection?

- [ ] A) Alexander Fleming
- [ ] B) Louis Pasteur
- [ ] C) Charles Darwin
- [ ] D) Isaac Newton
- [ ] E) Marie Curie

---

56 In the food chain oak leaf -> caterpillar -> wren -> sparrowhawk, which organism is the tertiary consumer?

- [ ] A) minnow
- [ ] B) grasshopper
- [ ] C) perch
- [ ] D) caterpillar
- [ ] E) sparrowhawk

© Revision Library | revisionlibrary.co.uk

57 In a coral reef, grass stores 1000 kJ of energy and the rabbits that eat it store 100 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- [ ] A) 0.1%
- [ ] B) 90%
- [ ] C) 900%
- [ ] D) 10%
- [ ] E) 1000%

---

58 5 quadrats, each of area 0.25 m^2, are placed at random in a field. The numbers of daisies counted are 6, 9, 5, 8, 7. Calculate the mean number per m2.

- [ ] A) 112 per m2
- [ ] B) 7 per m2
- [ ] C) 35 per m2
- [ ] D) 1.75 per m2
- [ ] E) 28 per m2

---

59 Why do cacti have spines instead of broad leaves?

- [ ] A) to float on water
- [ ] B) to reduce water loss
- [ ] C) to reduce water resistance when swimming
- [ ] D) to insulate the body against the cold
- [ ] E) to absorb more light

---

60 What word describes an animal that eats both plants and animals?

- [ ] A) producer
- [ ] B) decomposer
- [ ] C) omnivore
- [ ] D) carnivore
- [ ] E) herbivore

© Revision Library | revisionlibrary.co.uk

61 In the food chain rose bush -> greenfly -> wren -> cat, which organism is the secondary consumer?

- [ ] A) wren
- [ ] B) zebra
- [ ] C) mouse
- [ ] D) perch
- [ ] E) water flea

---

62 Which part of a flower is responsible for holding up the anther?

- [ ] A) stigma
- [ ] B) style
- [ ] C) filament
- [ ] D) ovary
- [ ] E) petals

---

63 What are the main features of arachnids?

- [ ] A) have a hard outer shell and more than four pairs of legs
- [ ] B) have eight legs and two body sections
- [ ] C) have a soft body, often protected by a shell
- [ ] D) have a soft, segmented body and no legs
- [ ] E) have six legs and three body sections

---

64 To which group of invertebrates does a woodlouse belong?

- [ ] A) molluscs
- [ ] B) insects
- [ ] C) arachnids
- [ ] D) annelids (segmented worms)
- [ ] E) crustaceans

© Revision Library | revisionlibrary.co.uk

65 Which group of animals have dry, scaly skin and lay eggs with leathery shells?

- A) birds
- B) mammals
- C) amphibians
- D) reptiles
- E) fish

---

66 Which of these animals is one of the fish?

- A) trout
- B) snake
- C) salamander
- D) tortoise
- E) dolphin

---

67 Name one nutrient (other than vitamin C) that is important for a healthy immune system.

(1)

---

68 In a pond, the producers in a food chain store 20000 kJ of energy. 12% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- A) 17600 kJ
- B) 240000 kJ
- C) 240 kJ
- D) 2400 kJ
- E) 24000 kJ

---

69 5 quadrats, each of area 0.25 m^2, are placed at random in a field. The numbers of clover plants counted are 2, 5, 3, 4, 6. Calculate the mean number per m2.

- A) 4 per m2
- B) 64 per m2
- C) 16 per m2
- D) 20 per m2
- E) 1 per m2

© Revision Library | revisionlibrary.co.uk

70 Why do many birds of prey have sharp, hooked beaks and claws?

- [ ] A) to dig for worms
- [ ] B) to insulate the body against the cold
- [ ] C) to keep their feet warm
- [ ] D) to filter food from water
- [ ] E) to catch and tear their prey

---

71 What is the name of the place where an organism lives?

- [ ] A) habitat
- [ ] B) species
- [ ] C) population
- [ ] D) community
- [ ] E) ecosystem

---

72 In the food chain lettuce -> slug -> hedgehog, which organism is the top predator?

- [ ] A) aphid
- [ ] B) hedgehog
- [ ] C) lettuce
- [ ] D) slug
- [ ] E) algae

---

73 Which part of a flower is responsible for holding up the stigma?

- [ ] A) anther
- [ ] B) style
- [ ] C) stigma
- [ ] D) filament
- [ ] E) ovary

---

74 What are the main features of crustaceans?

- [ ] A) have eight legs and two body sections
- [ ] B) have six legs and three body sections
- [ ] C) have a soft body, often protected by a shell
- [ ] D) have a hard outer shell and more than four pairs of legs
- [ ] E) have a soft, segmented body and no legs

© Revision Library | revisionlibrary.co.uk

75 To which group of invertebrates does a leech belong?

- [ ] A) annelids (segmented worms)
- [ ] B) insects
- [ ] C) arachnids
- [ ] D) molluscs
- [ ] E) crustaceans

---

76 What are the main features of fish?

- [ ] A) have dry, scaly skin and lay eggs with leathery shells
- [ ] B) have feathers and wings and lay hard-shelled eggs
- [ ] C) have moist skin and lay their eggs in water
- [ ] D) have hair or fur and feed their young on milk
- [ ] E) have gills and scales and live in water

---

77 To which group of vertebrates does a goldfish belong?

- [ ] A) birds
- [ ] B) amphibians
- [ ] C) fish
- [ ] D) reptiles
- [ ] E) mammals

---

78 A biology class of 25 students measured their height and recorded their ABO blood type. The blood types were: A = 10, B = 5, AB = 3, O = 7. Calculate the percentage of the class with blood type A.

(1)

---

79 In a meadow, the producers in a food chain store 10000 kJ of energy. 10% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 9000 kJ
- [ ] B) 100 kJ
- [ ] C) 100000 kJ
- [ ] D) 10000 kJ
- [ ] E) 1000 kJ

© Revision Library | revisionlibrary.co.uk

80 5 quadrats, each of area 1 m², are placed at random in a field. The numbers of buttercups counted are 3, 4, 1, 0, 2. Calculate the mean number per m2.

- [ ] A) 20 per m2
- [ ] B) 2 per m2
- [ ] C) 10 per m2
- [ ] D) 2.5 per m2
- [ ] E) 0.2 per m2

---

81 Why is a shark's body streamlined?

- [ ] A) to filter food from water
- [ ] B) to keep it warm
- [ ] C) to reduce water resistance when swimming
- [ ] D) to help it stay on the sea bed
- [ ] E) to attract prey or mates in the dark

---

82 What is the name of the process in which a muscle gets shorter?

- [ ] A) contraction
- [ ] B) relaxation
- [ ] C) respiration
- [ ] D) digestion
- [ ] E) extension

---

83 In the food chain grass -> grasshopper -> frog -> heron, which organism is the top predator?

- [ ] A) aphid
- [ ] B) frog
- [ ] C) cabbage
- [ ] D) heron
- [ ] E) grasshopper

© Revision Library | revisionlibrary.co.uk

84 Which part of a flower is responsible for containing the ovules and developing into the fruit?

- ☐ A) style
- ☐ B) ovule
- ☐ C) stigma
- ☐ D) ovary
- ☐ E) sepals

---

85 What are the main features of insects?

- ☐ A) have a hard outer shell and more than four pairs of legs
- ☐ B) have a soft body, often protected by a shell
- ☐ C) have a soft, segmented body and no legs
- ☐ D) have eight legs and two body sections
- ☐ E) have six legs and three body sections

---

86 To which group of invertebrates does a lobster belong?

- ☐ A) crustaceans
- ☐ B) molluscs
- ☐ C) arachnids
- ☐ D) insects
- ☐ E) annelids (segmented worms)

---

87 To which group of vertebrates does a duck belong?

- ☐ A) fish
- ☐ B) reptiles
- ☐ C) birds
- ☐ D) mammals
- ☐ E) amphibians

---

88 In a Year 9 cohort of 200 students, the blood types recorded were: A = 84, B = 40, AB = 12, O = 64. Calculate the percentage of the cohort with blood type B.

(1)

© Revision Library | revisionlibrary.co.uk

89 In a meadow, the producers in a food chain store 5000 kJ of energy. 12% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 4400 kJ
- [ ] B) 60 kJ
- [ ] C) 60000 kJ
- [ ] D) 600 kJ
- [ ] E) 6000 kJ

---

90 5 quadrats, each of area 1 m^2, are placed at random in a field. The numbers of daisies counted are 9, 8, 6, 10, 7. Calculate the mean number per m2.

- [ ] A) 80 per m2
- [ ] B) 10 per m2
- [ ] C) 40 per m2
- [ ] D) 0.8 per m2
- [ ] E) 8 per m2

---

91 Why do polar bears have a thick layer of fat under the skin?

- [ ] A) to insulate the body against the cold
- [ ] B) to dig for worms
- [ ] C) to help them float upwards
- [ ] D) to absorb more light
- [ ] E) to make them look larger

---

92 What do we call a change in the environment that a living thing can detect?

- [ ] A) receptor
- [ ] B) response
- [ ] C) stimulus
- [ ] D) hormone
- [ ] E) reflex

© Revision Library | revisionlibrary.co.uk

93 In the food chain oak leaf -> caterpillar -> wren -> sparrowhawk, which organism is the primary consumer?

- [ ] A) zebra
- [ ] B) caterpillar
- [ ] C) oak leaf
- [ ] D) lettuce
- [ ] E) snail

---

94 What is the main job of the stigma in a flower?

- [ ] A) receiving pollen
- [ ] B) containing the ovules and developing into the fruit
- [ ] C) holding up the stigma
- [ ] D) holding up the anther
- [ ] E) containing the female gamete and becoming the seed after fertilisation

---

95 What are the main features of molluscs?

- [ ] A) have six legs and three body sections
- [ ] B) have eight legs and two body sections
- [ ] C) have a soft, segmented body and no legs
- [ ] D) have a hard outer shell and more than four pairs of legs
- [ ] E) have a soft body, often protected by a shell

---

96 To which group of invertebrates does a bee belong?

- [ ] A) arachnids
- [ ] B) molluscs
- [ ] C) crustaceans
- [ ] D) insects
- [ ] E) annelids (segmented worms)

© Revision Library | revisionlibrary.co.uk

97 Which group of animals have gills and scales and live in water?

- ☐ A) amphibians
- ☐ B) mammals
- ☐ C) fish
- ☐ D) reptiles
- ☐ E) birds

---

98 Which of these animals is one of the birds?

- ☐ A) cow
- ☐ B) eagle
- ☐ C) human
- ☐ D) frog
- ☐ E) turtle

---

99 Animal faeces in a garden are broken down and recycled by soil organisms. Which group is mainly responsible for this decomposition?

(1)

---

100 In a pond, grass stores 50000 kJ of energy and the rabbits that eat it store 4000 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- ☐ A) 0.08%
- ☐ B) 1250%
- ☐ C) 8%
- ☐ D) 92%
- ☐ E) 46000%

---

101 5 quadrats, each of area 1 m^2, are placed at random in a field. The numbers of snails counted are 5, 9, 7, 6, 8. Calculate the mean number per m2.

- ☐ A) 35 per m2
- ☐ B) 70 per m2
- ☐ C) 0.7 per m2
- ☐ D) 7 per m2
- ☐ E) 8.75 per m2

© Revision Library | revisionlibrary.co.uk

102 Why is the fur of an Arctic hare white in winter?

- [ ] A) to stay cool
- [ ] B) to attract a mate
- [ ] C) to dig for worms
- [ ] D) to float on water
- [ ] E) for camouflage against the snow

---

103 Which structure carries nerve impulses from the brain down the back?

- [ ] A) tendon
- [ ] B) spinal cord
- [ ] C) artery
- [ ] D) ligament
- [ ] E) vein

---

104 In the food chain algae -> water flea -> minnow -> pike, which organism is the tertiary consumer?

- [ ] A) pike
- [ ] B) trout
- [ ] C) penguin
- [ ] D) dragonfly larva
- [ ] E) limpet

---

105 What is the main job of the style in a flower?

- [ ] A) protecting the flower bud
- [ ] B) holding up the stigma
- [ ] C) containing the ovules and developing into the fruit
- [ ] D) making pollen
- [ ] E) holding up the anther

© Revision Library | revisionlibrary.co.uk

106 What are the main features of annelids (segmented worms)?

- [ ] A) have six legs and three body sections
- [ ] B) have a hard outer shell and more than four pairs of legs
- [ ] C) have a soft body, often protected by a shell
- [ ] D) have eight legs and two body sections
- [ ] E) have a soft, segmented body and no legs

---

107 To which group of invertebrates does a ragworm belong?

- [ ] A) arachnids
- [ ] B) insects
- [ ] C) annelids (segmented worms)
- [ ] D) crustaceans
- [ ] E) molluscs

---

108 Which group of animals have feathers and wings and lay hard-shelled eggs?

- [ ] A) birds
- [ ] B) mammals
- [ ] C) fish
- [ ] D) reptiles
- [ ] E) amphibians

---

109 Which of these animals is one of the mammals?

- [ ] A) cod
- [ ] B) owl
- [ ] C) frog
- [ ] D) bat
- [ ] E) herring

---

110 Priya is a 14-year-old girl who needs approximately 1,940 kcal of energy per day. On one day, her meals and snacks provide: breakfast 380 kcal, lunch 560 kcal, dinner 720 kcal, and snacks 190 kcal. Calculate her total energy intake for that day.

(1)

© Revision Library | revisionlibrary.co.uk

111 In a pond, the producers in a food chain store 2000 kJ of energy. 15% of this energy is passed to the primary consumers. Calculate the energy passed on in kJ.

- [ ] A) 1700 kJ
- [ ] B) 30000 kJ
- [ ] C) 300 kJ
- [ ] D) 3000 kJ
- [ ] E) 30 kJ

---

112 5 quadrats, each of area 0.25 m^2, are placed at random in a field. The numbers of clover plants counted are 11, 12, 10, 8, 9. Calculate the mean number per m2.

- [ ] A) 10 per m2
- [ ] B) 2.5 per m2
- [ ] C) 50 per m2
- [ ] D) 40 per m2
- [ ] E) 160 per m2

---

113 Why do cacti have thick stems?

- [ ] A) to store water
- [ ] B) to spread their weight on soft sand
- [ ] C) to keep their feet warm
- [ ] D) to make food faster
- [ ] E) to catch insects

---

114 Which pair of muscles works together in the upper arm?

- [ ] A) biceps and hamstrings
- [ ] B) quadriceps and hamstrings
- [ ] C) triceps and hamstrings
- [ ] D) biceps and quadriceps
- [ ] E) biceps and triceps

© Revision Library | revisionlibrary.co.uk

115 What is the main job of the sepals in a flower?

- [ ] A) containing the female gamete and becoming the seed after fertilisation
- [ ] B) making pollen
- [ ] C) attracting insects
- [ ] D) holding up the stigma
- [ ] E) protecting the flower bud

---

116 Which group of animals have a soft body, often protected by a shell?

- [ ] A) molluscs
- [ ] B) crustaceans
- [ ] C) arachnids
- [ ] D) annelids (segmented worms)
- [ ] E) insects

---

117 Which of these animals is one of the molluscs?

- [ ] A) woodlouse
- [ ] B) squid
- [ ] C) butterfly
- [ ] D) lugworm
- [ ] E) crab

---

118 Which group of animals have moist skin and lay their eggs in water?

- [ ] A) mammals
- [ ] B) fish
- [ ] C) amphibians
- [ ] D) reptiles
- [ ] E) birds

---

119 To which group of vertebrates does a horse belong?

- [ ] A) fish
- [ ] B) birds
- [ ] C) amphibians
- [ ] D) mammals
- [ ] E) reptiles

© Revision Library | revisionlibrary.co.uk

120 A class of 25 students recorded their eye colour. The distribution was: brown = 10, blue = 8, green = 5, hazel = 2. Calculate the percentage of students with blue eyes.

(1)

---

121 In a meadow, grass stores 5000 kJ of energy and the rabbits that eat it store 400 kJ. Calculate the percentage of energy transferred from the grass to the rabbits.

- ☐ A) 4600%
- ☐ B) 8%
- ☐ C) 92%
- ☐ D) 1250%
- ☐ E) 0.08%

---

122 Energy is lost between each trophic level (stage) of a food chain.

(a) State two ways in which energy is lost from one trophic level to the next. **(2)**

(b) A field contains grass with a total energy content of 8,000 kJ. The grasshoppers that eat this grass contain a total of 640 kJ of energy. Calculate the percentage of energy transferred from the grass to the grasshoppers. **(2)**

(c) One oak tree can support thousands of caterpillars, which are eaten by only a few birds. Explain why a pyramid of numbers for this food chain would not be a true pyramid shape, even though a pyramid of biomass for the same food chain would be. **(1)**

© Revision Library | revisionlibrary.co.uk

123 5 quadrats, each of area 0.25 m², are placed at random in a field. The numbers of buttercups counted are 9, 7, 11, 10, 8. Calculate the mean number per m2.

- [ ] A) 9 per m2
- [ ] B) 2.25 per m2
- [ ] C) 45 per m2
- [ ] D) 36 per m2
- [ ] E) 144 per m2

---

124 Why do desert animals such as camels have large, flat feet?

- [ ] A) to spread their weight on soft sand
- [ ] B) to dig for water
- [ ] C) to stay cool
- [ ] D) to absorb more light
- [ ] E) to keep their feet warm

© Revision Library | revisionlibrary.co.uk

Mark scheme · 3.10 Biology: Plants, Ecology and Health: 2-hour Pack

Question 1

C (28 per m2) **B1**

Answer: C) 28 per m2

Question 2

C (fungus) **B1**

Answer: C) fungus

Question 3

B (algae) **B1**

Answer: B) algae

Question 4

D (ovule) **B1**

Answer: D) ovule

Question 5

A (crab) **B1**

Answer: A) crab

Question 6

E (salamander) **B1**

Answer: E) salamander

Question 7

6% (oe) **B1**

Answer: 6%

Question 8

B (1500 kJ) **B1**

Answer: B) 1500 kJ

Question 9

E (16000) **B1**

Answer: E) 16000

Question 10

D (hinge joint) **B1**

Answer: D) hinge joint

Question 11

A (grasshopper) **B1**

Answer: A) grasshopper

Question 12

C (stigma) **B1**

Answer: C) stigma

Question 13

B (break them down and return nutrients to the soil) **B1**

Answer: B) break them down and return nutrients to the soil

Question 14

D (nettle) **B1**

Answer: D) nettle

Question 15

C (lobster) **B1**

Answer: C) lobster

Question 16

A (eagle) **B1**

Answer: A) eagle

Question 17

70 kcal deficit (oe) **B1**

Answer: 70 kcal deficit

Question 18

E (15000 kJ) **B1**

Answer: E) 15000 kJ

Question 19

B (5 per m2) **B1**

Answer: B) 5 per m2

Question 20

E (community) **B1**

Answer: E) community

Question 21

D (mouse) **B1**

Answer: D) mouse

Question 22

A (bee) **B1**

Answer: A) bee

Question 23

C (reptiles) **B1**

Answer: C) reptiles

Question 24

5% (oe) **B1**

Answer: 5%

Question 25

C (100 kJ) **B1**

Answer: C) 100 kJ

Question 26

E (7 per m2) **B1**

Answer: E) 7 per m2

Question 27

A (brain) **B1**

Answer: A) brain

Question 28

D (lion) **B1**

Answer: D) lion

© Revision Library | revisionlibrary.co.uk

Question 29

B (leech) **B1**

Answer: B) leech

Question 30

D (lizard) **B1**

Answer: D) lizard

Question 31

Carbohydrate (or glucose, or protein, or fat) (oe) **B1**

Answer: Carbohydrate (or glucose, or protein, or fat)

Question 32

B (8%) **B1**

Answer: B) 8%

Question 33

E (4800) **B1**

Answer: E) 4800

Question 34

A (ribs) **B1**

Answer: A) ribs

Question 35

C (the direction of energy flow) **B1**

Answer: C) the direction of energy flow

Question 36

B (mite) **B1**

Answer: B) mite

Question 37

E (crocodile) **B1**

Answer: E) crocodile

Question 38

8% (oe) **B1**

Answer: 8%

Question 39

C (12%) **B1**

Answer: C) 12%

Question 40

A (48 per m2) **B1**

Answer: A) 48 per m2

Question 41

D (chromosomes) **B1**

Answer: D) chromosomes

Question 42

B (lion) **B1**

Answer: B) lion

Question 43

E (insects) **B1**

Answer: E) insects

Question 44

A (ostrich) **B1**

Answer: A) ostrich

Question 45

Decomposers (bacteria and fungi) (oe) **B1**

Answer: Decomposers (bacteria and fungi)

Question 46

C (200 kJ) **B1**

Answer: C) 200 kJ

Question 47

D (3 per m2) **B1**

Answer: D) 3 per m2

Question 48

D (asexual reproduction) **B1**

Answer: D) asexual reproduction

Question 49

C (heron) **B1**

Answer: C) heron

Question 50

E (mussel) **B1**

Answer: E) mussel

Question 51

B (amphibians) **B1**

Answer: B) amphibians

Question 52

9% (oe) **B1**

Answer: 9%

Question 53

A (15%) **B1**

Answer: A) 15%

Question 54

A (6 per m2) **B1**

Answer: A) 6 per m2

Question 55

C (Charles Darwin) **B1**

Answer: C) Charles Darwin

Question 56

E (sparrowhawk) **B1**

Answer: E) sparrowhawk

Question 57

D (10%) **B1**

Answer: D) 10%

Question 58

E (28 per m2) **B1**

Answer: E) 28 per m2

© Revision Library | revisionlibrary.co.uk

Question 59

B (to reduce water loss) **B1**

Answer: B) to reduce water loss

Question 60

C (omnivore) **B1**

Answer: C) omnivore

Question 61

A (wren) **B1**

Answer: A) wren

Question 62

C (filament) **B1**

Answer: C) filament

Question 63

B (have eight legs and two body sections) **B1**

Answer: B) have eight legs and two body sections

Question 64

E (crustaceans) **B1**

Answer: E) crustaceans

Question 65

D (reptiles) **B1**

Answer: D) reptiles

Question 66

A (trout) **B1**

Answer: A) trout

Question 67

Vitamin D (or zinc) (oe) **B1**

Answer: Vitamin D (or zinc)

Question 68

D (2400 kJ) **B1**

Answer: D) 2400 kJ

Question 69

C (16 per m2) **B1**

Answer: C) 16 per m2

Question 70

E (to catch and tear their prey) **B1**

Answer: E) to catch and tear their prey

Question 71

A (habitat) **B1**

Answer: A) habitat

Question 72

B (hedgehog) **B1**

Answer: B) hedgehog

Question 73

B (style) **B1**

Answer: B) style

Question 74

D (have a hard outer shell and more than four pairs of legs) **B1**

Answer: D) have a hard outer shell and more than four pairs of legs

Question 75

A (annelids (segmented worms)) **B1**

Answer: A) annelids (segmented worms)

Question 76

E (have gills and scales and live in water) **B1**

Answer: E) have gills and scales and live in water

Question 77

C (fish) **B1**

Answer: C) fish

Question 78

40% (oe) **B1**

Answer: 40%

Question 79

E (1000 kJ) **B1**

Answer: E) 1000 kJ

Question 80

B (2 per m2) **B1**

Answer: B) 2 per m2

Question 81

C (to reduce water resistance when swimming) **B1**

Answer: C) to reduce water resistance when swimming

Question 82

A (contraction) **B1**

Answer: A) contraction

Question 83

D (heron) **B1**

Answer: D) heron

Question 84

D (ovary) **B1**

Answer: D) ovary

Question 85

E (have six legs and three body sections) **B1**

Answer: E) have six legs and three body sections

Question 86

A (crustaceans) **B1**

Answer: A) crustaceans

Question 87

C (birds) **B1**

Answer: C) birds

Question 88

20% (oe) **B1**

Answer: 20%

© Revision Library | revisionlibrary.co.uk

Question 89

D (600 kJ) **B1**

Answer: D) 600 kJ

Question 90

E (8 per m2) **B1**

Answer: E) 8 per m2

Question 91

A (to insulate the body against the cold) **B1**

Answer: A) to insulate the body against the cold

Question 92

C (stimulus) **B1**

Answer: C) stimulus

Question 93

B (caterpillar) **B1**

Answer: B) caterpillar

Question 94

A (receiving pollen) **B1**

Answer: A) receiving pollen

Question 95

E (have a soft body, often protected by a shell) **B1**

Answer: E) have a soft body, often protected by a shell

Question 96

D (insects) **B1**

Answer: D) insects

Question 97

C (fish) **B1**

Answer: C) fish

Question 98

B (eagle) **B1**

Answer: B) eagle

Question 99

Decomposers (bacteria and fungi) (oe) **B1**

Answer: Decomposers (bacteria and fungi)

Question 100

C (8%) **B1**

Answer: C) 8%

Question 101

D (7 per m2) **B1**

Answer: D) 7 per m2

Question 102

E (for camouflage against the snow) **B1**

Answer: E) for camouflage against the snow

Question 103

B (spinal cord) **B1**

Answer: B) spinal cord

Question 104

A (pike) **B1**

Answer: A) pike

Question 105

B (holding up the stigma) **B1**

Answer: B) holding up the stigma

Question 106

E (have a soft, segmented body and no legs) **B1**

Answer: E) have a soft, segmented body and no legs

Question 107

C (annelids (segmented worms)) **B1**

Answer: C) annelids (segmented worms)

Question 108

A (birds) **B1**

Answer: A) birds

Question 109

D (bat) **B1**

Answer: D) bat

Question 110

1850 kcal (oe) **B1**

Answer: 1850 kcal

Question 111

C (300 kJ) **B1**

Answer: C) 300 kJ

Question 112

D (40 per m2) **B1**

Answer: D) 40 per m2

Question 113

A (to store water) **B1**

Answer: A) to store water

Question 114

E (biceps and triceps) **B1**

Answer: E) biceps and triceps

Question 115

E (protecting the flower bud) **B1**

Answer: E) protecting the flower bud

Question 116

A (molluscs) **B1**

Answer: A) molluscs

Question 117

B (squid) **B1**

Answer: B) squid

Question 118

C (amphibians) **B1**

Answer: C) amphibians

© Revision Library | revisionlibrary.co.uk

Question 119

D (mammals) **B1**

Answer: D) mammals

Question 120

32% (oe) **B1**

Answer: 32%

Question 121

B (8%) **B1**

Answer: B) 8%

Question 122

(a) energy lost as heat, from respiration and movement **B1**

(a) energy lost in waste/faeces/urine, or in parts of the organism not eaten (any one) **B1**

(a) Answer: Any two of: heat from respiration/movement; waste (faeces/urine); parts not eaten.

(b) 640 / 8000 x 100 oe **M1**

(b) 8% cao **A1**

(b) Answer: 8%

(c) the oak tree is counted as a single organism (a small number), even though its mass is far greater than the combined mass of the caterpillars, so numbers give an unusual shape while biomass still gives a true pyramid oe **B1**

(c) Answer: The tree counts as only one organism despite having a huge mass, so the numbers pyramid is an odd shape, but the biomass pyramid (based on mass, not numbers) stays a true pyramid.

Question 123

D (36 per m2) **B1**

Answer: D) 36 per m2

Question 124

A (to spread their weight on soft sand) **B1**

Answer: A) to spread their weight on soft sand

© Revision Library | revisionlibrary.co.uk