MASTERMIND SCHOLARS EDUCATIONAL CENTRE

BIOLOGY EXAMINATION

ECOLOGY 3 – SOIL

1. Which of the following agricultural practices will NOT promote soil conservation?

A. Afforestation

B. Bush burning

C. Crop rotation

D. Manuring

E. Mulching

2. An essential element whose deficiency in plants will result in poor growth, particularly of the roots, and is essential for cell wall formation is _____

A. Calcium

B. Iron

C. Magnesium

D. Nitrogen

E. Phosphorus

3. Root pressure and the transpiration pull are biophysical processes which account for the?

A. Ascent of water into leaves

B. Exchange of gases at leaf surfaces

C. Movement of manufactured food from leaves to storage tissues

D. Opening and closing of stomata

E. Release of energy from glucose molecules

4. Which of the following agricultural activities has the least harmful effect on the environment?

A. Application of fertilizers

B. Practicing crop rotation

C. Practicing monocropping

D. Spraying herbicides

E. Spraying pesticides

5. Which material is NOT necessary for the manufacture of plant food?

A. Carbon(iv)oxide

B. Chlorophyll

C. Oxygen

D. Sunlight

E. Water

6. The movement of food in soluble form within the vascular bundles to all parts of the plant is known as _____

A. Diffusion

B. Evaporation

C. Transportation

D. Translocation

E. Transpiration

7. Which is NOT a carnivorous plant?

A. Bladderwort

B. Dodder plant

C. Drosera

D. Pitcher plant

E. Venus flytrap

8. What can be used to collect soil animals?

A. Insect net

B. Plankton net

C. Pooter

D. Quadrat

E. Tullgren funnel

9. Herbicides are agricultural chemicals that _____

A. Encourage growth of weeds

B. Increase the soil fertility

C. Improve disease resistance of crop

D. Suppress crop growth

E. Suppress weed growth

10. Iron is mainly required by plants for _____ formation.

A. Chlorophyll

B. Glucose

C. Protein

D. Nuclear

E. Nucleoproteins

11. Nitrifying bacteria keep the soil fertile by

A. converting nitrate to nitrogen

B. converting ammonium salt to nitrate

C. converting atmospheric nitrogen to plant nitrogen

D. converting nitrate to nitrous oxide

E. converting atmospheric nitrogen to nitrates

12. Which of these elements in plants is required in small quantities only?

A. Boron

B. Nitrogen

C. Phosphorus

D. Magnesium

E. Potassium

13. Which of the substances listed below is a trace element of plants?

A. Potassium

B. Sodium

C. Copper

D. Phosphate

E. Nitrate

14. Which of these is not a type of soil?

A. Sand

B. Granite

C. Loam

D. Clay

E. Sandy loam

15. The farmer cannot check soil erosion effectively by

A. Constructing ridges or planting across the slope

B. Cultivating cover crops

C. Practising strip farming

D. Clearing the land of vegetation

E. Constructing terraces

16. Bacteria inhabiting legume root nodules and which add atmospheric nitrogen to the soil are referred to as

A. Denitrifying bacteria

B. Nitrifying bacteria

C. Nitrogen fixing bacteria

D. Nitrogen freeing bacteria

E. Nitrogen putrefying bacteria

17. Magnesium is utilized in the formation of

A. ATP

B. Glucose

C. Amino acids

D. Chlorophyll

E. Fats

18. Root hair have their origin from

A. Endodermis

B. Pericycle

C. Cortex

D. Epidermis

E. Xylem

19. If the bark and phloem tissue of a woody shoot are peeled off by ringing, the whole plant will eventually die because?

A. water does not reach the leaves

B. water and salts remained below the ring portion

C. there is a withdrawal of water from the root by soil

D. manufactured food does not reach the roots

E. the roots store too much water

20. Leguminous plants, e.g. Mucuna, are usually planted in cultivated farmlands because they

A. enrich the soil with phosphates

B. provide animals with food

C. enrich the soil with organic nitrogen

D. protect the soil from being over-heated

E. protect the micro-organisms in the soil

21. Nitrification means

A. conversion of nitrates to nitrogen

B. fixing nitrogen into plants

C. conversion of nitrates to nitrites

D. changing of ammonia to nitrites, then nitrates

E. nitrogen cycle

22. Soil is said to be fertile if

A. It is black

B. it can supply usable nutrients to plants

C. the oxygen content is very high

D. artificial manure is added to it

E. it is not waterlogged

23. Some of the major elements required by plants are

A. Potassium, nitrogen, phosphorus, sodium, calcium

B. Nitrogen, phosphorus, molybdenum, sodium, calcium

C. Potassium, phosphorus, molybdenum, sodium, calcium

D. Potassium, nitrogen, iron, sodium, calcium

E. Potassium, nitrogen, phosphorus, silicon, cadmium

24. Roots of plants are normally

A. Positively phototropic

B. Negatively geotropic

C. Negatively hydrotropic

D. Positively hydrotropic

E. Negatively chemotropic

25. If a farmer left his land uncultivated for five years before returning to it, he must be practising

A. modern agriculture

B. strip cropping

C. contour ridging

D. crop rotation

E. the bush fallow system

26. Herbs differ from shrubs because they

A. do not produce fruit

B. are useful to herbalists

C. do not become woody

D. are only annual

E. are only perennials

27. Which of the following elements are necessary for the formation of chlorophyll in a plant?

A. Magnesium and iron

B. Calcium and potassium

C. Calcium and sulphur

D. Potassium and sulphur

E. Phosphorus and potassium

28. 28 g soil sample was heated to a constant weight of 24 g. When further heated to red hot and cooled, it weighed 18 g. What is the percentage of humus in the soil?

A. 22.2

B. 55.6

C. 75.0

D. 25.0

E. 35.7

29. Erosion can be reduced along a slope by

A. ridging across slope

B. ridging up slope

C. ridging down slope

D. crop rotation

E. bush fallowing system

30. If a handful of soil is shaken with water and left to settle, the soil particles will settle from light to heavy particles as follows

A. humus, clay, silt, sand, stones

B. humus, silt, clay, sand, stones

C. humus, clay, silt, stones, sand

D. humus, sand, silt, clay, stones

E. clay, humus, silt, sand, stones

31. Denitrifying bacteria in nature liberate gaseous nitrogen directly from

A. ammonium salts

B. soil nitrates

C. thunderstorms

D. soil nitrites

E. plant and animal proteins

32. Leaching is

A. Washing away of humus from the soil surface

B. reducing of soil aeration by pressure

C. soil erosion by means other than rainfall

D. loss of organic matter due to exposure to direct sunlight

E. washing out chalk and limestone from upper layers by heavy rains

33. The process of soil erosion is usually from

A. rill → sheet → gully

B. gully → rill → sheet

C. sheet → gully → rill

D. sheet → rill → gully

E. rill → gully → sheet

34. Soil erosion CANNOT be controlled by

A. planting cover crops

B. contouring of sloping ground

C. terracing of slopes

D. laying of mulch

E. burning of bush

35. Water retention is highest in soils which are rich in

A. sand, poor in humus and devoid of clay

B. clay and sand, but poor in humus

C. clay and humus, but poor in sand

D. clay, poor in humus and devoid of sand

E. sand and humus, but poor in clay

36. The origin of mineral particles in the soil is

A. humus

B. water

C. micro-organisms

D. weathered rock

E. organic matter

37. Atmospheric nitrogen is directly replenished in nature through

A. the activities of denitrifying bacteria

B. the breakdown of ammonium salts in the soil

C. the activities of nitrifying bacteria

D. the activities of nitrogen-fixing bacteria in root nodules

E. egestion, death and decay

38. The initial volume of water poured into 60 g bag of dry soil was 50 ml and the amount that drained through was 35 ml. The percentage water content of the fully soaked soil is therefore

A. 46.7

B. 25.0

C. 20.0

D. 30.0

E. 58.3

39. Samples of different soil types are packed in glass tubes whose lower ends are plugged with cotton wool. If these tubes are suspended in a trough of water, water will rise highest after a few hours in

A. sand

B. loamy

C. clay

D. humus

40. In demonstrating the importance of mineral elements in plants, the culture bottle must be darkened to

A. prevent algal growth in culture solution

B. allow root growth

C. prevent breakdown of mineral elements

D. prevent photosynthesis in the root

41. Which of the following relates to edaphic factors?

A. The structure of the earth's surface

B. The influence of living organisms on each other

C. Temperature, rainfall and humidity

D. The influence of soils on plants and animals

42. Nitrifying bacteria are important because they

A. release nitrogen to the atmosphere

B. convert atmospheric nitrogen to ammonia

C. combine ammonia with nitrogen

D. oxidize ammonium salt to nitrates

43. The process by which lime is added to clay soil is known as

A. sedimentation

B. flocculation

C. leaching

D. manuring

44. The mineral nutrient that is most bound to the soil is

A. phosphorus

B. calcium

C. iron

D. potassium

45. The mineral nutrient that easily gets leached out of the soil is

A. phosphorus

B. calcium

C. magnesium

D. nitrate

46. 5 g of oven dried soil was heated in a furnace for 24 hours. After cooling, it weighed 4.8 g. What is the amount of humus in the soil?

A. 40.0 g per 100 g dry soil

B. 4.4 g per 100 g dry soil

C. 4.0 g per 100 g dry soil

D. 0.4 g per 100 g dry soil

47. Most irrigated lands often become unproductive in later years because of

A. loss of fertility

B. increase in salinity

C. soil erosion

D. loss of water

48. Farmers practise crop rotation because it

A. helps to prevent soil erosion

B. allows two crops to be planted at the same time

C. helps to conserve soil fertility

D. is an alternate to shifting cultivation

49. An acidic soil can be improved upon by

A. sedimentation

B. leaching

C. flocculation

D. watering

50. What do bacteria in root nodules derive from the host plant?

A. Protection and minerals

B. Water and minerals

C. Carbohydrates and water

D. Protection and carbohydrates