Myfuture CBC Revision

biology - Grade 10

Question Paper

1. Which chemical equation represents aerobic respiration of glucose in plant cells (simplified)?

A. Glucose Ethanol + Carbon dioxide + Energy

B. Carbon dioxide + Water + Light Glucose + Oxygen

C. Oxygen Glucose + Carbon dioxide

D. Glucose + Oxygen Carbon dioxide + Water + Energy (ATP)

2. What does double circulation mean in animals such as mammals and birds?

A. Blood flows only in one loop from heart to gills and back

B. Blood passes through the heart twice during one complete circuit of the body (separate
C. Blood mixes freely in a single ventricle before being pumped out
D. Blood travels through two hearts in the body

3. How is a root hair cell specialised for water and mineral absorption?

A. By having a thick cuticle

B. By having many chloroplasts

C. By having a long thin extension to increase surface area

D. By having a rigid lignified wall

4. How are ruminant animals like cows able to digest cellulose from grass?

A. Their teeth produce special enzymes

B. Strong stomach acids destroy cellulose

C. Symbiotic microorganisms in the rumen break down cellulose
D. The small intestine secretes cellulase

5. Why must specimen labels include the exact location (preferably GPS coordinates)?

A. To make the label look more scientific

B. To keep the location secret from other researchers

C. So the specimen can be used as a souvenir

D. So researchers can find where the specimen came from and study its habitat or repeat

6. Which enzyme in saliva begins the digestion of starch in the mouth?

A. Pepsin

B. Lipase

C. Trypsin

D. Amylase

7. Which statement about sieve tube elements in phloem is correct?

A. Sieve tube elements are heavily lignified and conduct water
B. Sieve tube elements have thick cellulose walls and store starch
C. Sieve tube elements are photosynthetic guard cells

D. Sieve tube elements lack a nucleus at maturity and are assisted by companion cells

8. Which type of cell in a plant lacks chloroplasts and is specialised for transporting water?

A. Xylem vessel

B. Root hair cell

C. Mesophyll cell

D. Guard cell

9. Why does countercurrent flow in fish gills result in more oxygen uptake than parallel flow?

A. It maintains a favourable oxygen gradient along the entire lamella
B. It mixes oxygen and carbon dioxide in the water

C. It warms the water to hold more oxygen

D. It moves water faster so fish swim slower

10. Which pigment carries oxygen in human blood?

A. Haemoglobin

B. Keratin

C. Chlorophyll

D. Hemocyanin

11. What immediate effect does hyperventilation have on blood gases and pH?

A. It raises carbon dioxide and lowers pH

B. It increases blood nitrogen causing acidosis

C. It lowers blood carbon dioxide and raises blood pH (becomes more alkaline)

D. It decreases oxygen causing immediate anaemia

12. What causes stomata to open during the day in many plants?

A. Loss of sugars from guard cells making them flaccid

B. Increase in CO2 inside the leaf causing guard cells to close

C. Accumulation of K+ ions in guard cells, causing water to enter and guard cells to

D. Decrease in light intensity causing guard cells to shrink

13. What type of bond holds two amino acids together in a protein chain?

A. Hydrogen bond

B. Ionic bond

C. Peptide bond

D. Disulfide bridge

14. What is the main purpose of fixation in specimen preservation?

A. To feed microbes so they grow faster

B. To stop decay and stabilize tissues so structures remain as they were in life

C. To make the specimen taste different

D. To permanently colour the specimen blue

15. What effect does increasing temperature beyond the optimum generally have on an enzyme's activity?

A. It turns the enzyme into DNA

B. It always increases activity indefinitely

C. It denatures the enzyme and reduces activity

D. It makes the enzyme into a carbohydrate

16. Which type of circulation do fish have?

A. Single circulation where blood passes once through the heart per circuit

B. Double circulation with separate pulmonary and systemic hearts

C. Double complete circulation with no mixing

D. Open circulation like insects

17. What is one major function of the central vacuole in plant cells?

A. To make proteins

B. To store water and maintain cell turgor

C. To control respiration

D. To transmit nerve impulses

18. Which method is best for preserving plant samples for a herbarium collection?

A. Coat the plant in oil to stop drying

B. Press the plant between newspaper sheets and dry in a plant press

C. Store fresh plants in water for weeks

D. Freeze whole plants at -80°C immediately

19. What is the main role of enzymes in biological systems?

A. To transmit genetic information

B. To provide structural support to cells

C. To act as long-term energy stores

D. To speed up chemical reactions without being used up

20. Which fatty acid type has no double bonds between carbon atoms and is usually solid at room temperature?

A. Monounsaturated fatty acid

B. Saturated fatty acid

C. Polyunsaturated fatty acid

D. Trans fat only

21. Which tissue transports organic nutrients (mainly sucrose) from leaves to other parts of the plant?

A. Pericycle

B. Phloem

C. Endodermis

D. Xylem

22. Which explanation describes the cohesion-tension theory of water transport in plants?

A. Water is pushed up by air pressure from the soil

B. Water moves up due to root cap cell division

C. Water is pulled up the xylem by a continuous column due to cohesion between water

D. Water is pumped upward by xylem cells using ATP

23. What role do chemoreceptors play in breathing control?

A. They physically pump air in and out of lungs

B. They digest inhaled pathogens

C. They detect blood CO_2, O_2 and pH levels and signal the respiratory centre to adjust breathing

D. They produce surfactant to keep alveoli open

24. Which of the following increases the rate of gas exchange in a leaf?

A. More stomata per unit area

B. Thicker cuticle

C. Smaller intercellular air spaces

D. Reduced leaf surface area

25. Which of the following best describes an ecosystem?

A. Only non-living factors such as water and soil

B. Only the plants in an area

C. Interactions between living organisms and their physical environment

D. A group of the same species living in one place

26. How is most carbon dioxide transported from tissues to the lungs?

A. Mostly dissolved as CO_2 gas in plasma

B. All bound to platelets

C. Only as carbonic acid in red blood cells

D. As bicarbonate ions (HCO_3^-) in the plasma

27. How do most insects carry oxygen to their body cells?

A. Blood carrying oxygen bound to haemoglobin

B. Lungs with alveoli

C. Gills under their wings

D. Air-filled tracheae and spiracles with diffusion to cells

28. What distinguishes rough endoplasmic reticulum (RER) from smooth endoplasmic reticulum (SER)?

A. RER stores water; SER transports water

B. RER has ribosomes on its surface and is involved in protein synthesis; SER lacks

C. RER is only found in plant cells while SER is only in animal cells

D. RER produces ATP while SER digests food

29. What does the cell theory state about the origin of cells?

A. Cells are formed only during photosynthesis

B. Cells are produced by sunlight acting on chemicals

C. Cells arise spontaneously from non-living matter

D. All cells come from pre-existing cells

30. Which feature best distinguishes eukaryotic cells from prokaryotic cells?

A. Lack of any organelles

B. Having a cell wall

C. Presence of a membranebound nucleus

D. Being always smaller in size

31. Which statement about the leaf cuticle is true in relation to gaseous exchange?

A. The cuticle facilitates rapid gas exchange

B. The cuticle reduces water loss but limits direct gas diffusion through the epidermis

C. The cuticle is impermeable and prevents all gas movement

D. The cuticle stores gases for photosynthesis

32. Which of the following animals is a specialised carnivore?

A. Cow

B. Lion

C. Chicken

D. Goat

33. Which element is present in proteins but not in carbohydrates?

A. Nitrogen

B. Hydrogen

C. Carbon

D. Oxygen

34. What is a voucher specimen and why is it collected?

A. A living pet taken from the field

B. A preserved representative specimen kept in a collection so others can verify the identity of a
C. A free ticket to visit a museum

D. A specimen that is only photographed and not preserved

35. How should blood samples usually be handled for short-term transport to the laboratory?

A. Freeze and thaw repeatedly during transport

B. Shake the tube violently before transport

C. Leave at room temperature in direct sun

D. Keep cool (around 4°C) and deliver soon, using appropriate tubes

36. A balanced diet for farm animals should include which combination?

A. Proteins, carbohydrates, fats, vitamins and minerals

B. Only fats and proteins

C. Only vitamins and minerals

D. Only carbohydrates and water

37. During the night, plants typically close most stomata. What is the main reason for this?

A. To increase uptake of nitrogen

B. To allow more oxygen to enter

C. To conserve water and because photosynthesis does not occur
D. To stop root respiration

38. Which structure is the main site of gaseous exchange in the leaves of most terrestrial plants?

A. Stomata on the leaf surface

B. Root hair cells

C. Xylem vessels

D. Palisade mesophyll cells

39. What is the function of guard cells around a stomatal pore?

A. To store glucose

B. To open and close the stomata for gas exchange and water control
C. To perform photosynthesis only at night

D. To make the leaf rigid

40. What is the primary function of the cell (plasma) membrane?

A. Store genetic information

B. Provide rigid support and shape

C. Control movement of substances into and out of the cell

D. Produce energy by respiration

41. Which structure allows fish to extract oxygen from water?

A. Gills

B. Skin

C. Trachea

D. Lungs

42. What is the primary gas taken in by leaves for photosynthesis during the day?

A. Carbon dioxide

B. Oxygen

C. Methane

D. Nitrogen

43. Which pathway for water movement in roots goes through the cell walls and spaces between cells without crossing membranes?

A. Transmembrane pathway

B. Vacuolar pathway

C. Apoplast pathway

D. Symplast pathway

44. Which feature is typical of a hindgut fermenter such as a horse or rabbit?

A. Large caecum for fermentation

B. Four-chambered stomach

C. Crop and gizzard

D. No intestine

45. Which organelle is known as the 'powerhouse' of the cell because it produces energy?

A. Ribosome

B. Mitochondrion

C. Chloroplast

D. Golgi apparatus

46. During anaerobic respiration (fermentation) in plant cells (e.g., waterlogged roots), which products are commonly formed?

A. Oxygen and glucose

B. Carbon dioxide and water only

C. Ammonia and oxygen

D. Ethanol and carbon dioxide

47. Which factor does NOT directly affect the rate of respiration in plant tissues?

A. Temperature

B. Availability of substrate (glucose)

C. Availability of oxygen

D. Light intensity for dark respiration

48. Which statement about insect transport is correct?

A. Insects have no circulatory fluid at all

B. Insects have an open circulatory system and use a tracheal system to deliver oxygen directly

C. Insects use blood to transport oxygen to all body cells

D. Insects have a closed circulatory system with lungs like mammals

49. Which test would you use to detect the presence of starch in a food sample?

A. Benedict's solution

B. Iodine (iodine-potassium iodide) solution

C. Biuret reagent

D. Sudan III

50. What is the basic building block (monomer) of proteins?

A. Amino acids

B. Fatty acids

C. Monosaccharides

D. Nucleotides