ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

BIOLOGY 9190/1

PAPER 1 Multiple Choice

JUNE 2018 SESSION 1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your name, centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score **one** mark. A mark will **not** be deducted for a wrong answer.

This question paper consists of 10 printed pages and 2 blank pages.

1 Which process uses ATP in transporting substances across membranes?

A endocytosis
B osmosis
C diffusion
D facilitated diffusion

2 The resolution of a light microscope is small because the radiation used has

A a lot of energy.
B a longer wavelength.
C a shorter wavelength.
D little energy.

3 Which organelle is present in eukaryotic cells only?

A cell wall
B endoplasmic reticulum
C mesosome
D 70S ribosome

4 An enzyme-secreting cell contains increased amounts of

A DNA.
B Golgi body.
C mitochondria.
D smooth ER.

5 Which statement is correct about the density of water?

A Density increases as temperature rises between 0°C and 4°C.
B Density increases as temperature decreases below 0°C.
C The minimum density of water is at 0°C.
D The minimum density of water is at 4°C.

6 A nucleoside consists of a

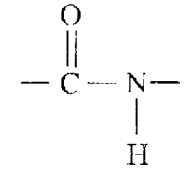
A phosphate, a sugar and a base.
B sugar and a base.
C phosphate and a base.
D sugar and a phosphate.

7 The reaction shows chemical digestion in the stomach:

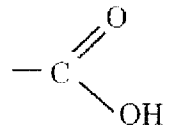
$$\text{polypeptide} \xrightarrow{\text{enzyme}} \text{amino acids}$$

Which type of bond is broken down by the enzyme?

A



B



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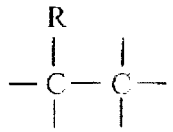
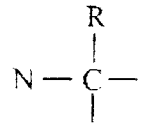
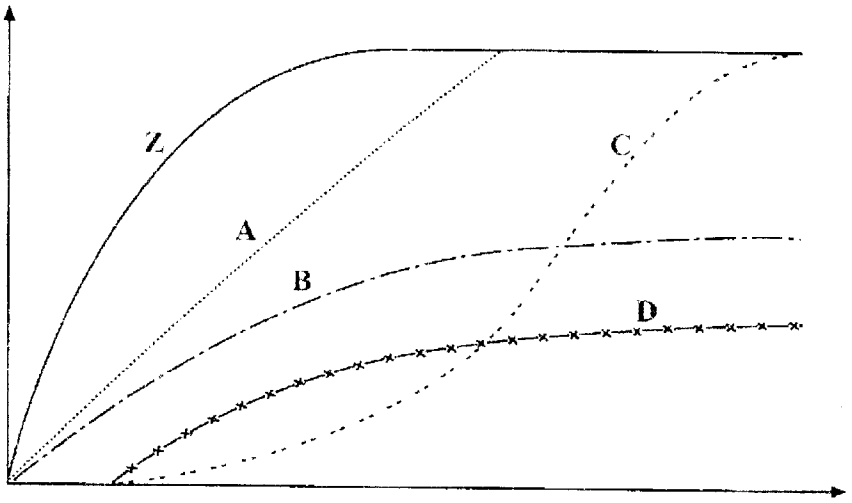


D



8 Curve **Z** represents the relationship between an enzyme and the concentration of its substrate under optimum conditions and without an inhibitor.

Which curve, **A**, **B**, **C** or **D** represents the result when the same experiment is carried out in the presence of a non-competitive inhibitor?



9 HIV causes host cells to produce a viral enzyme which breaks down polypeptide chains.

An effective drug against the viral enzyme must

A be a non-competitive inhibitor for the enzyme.
B be a competitive inhibitor for all enzymes.
C have a specific structure that inhibits only the viral enzyme.
D inhibit many types of viral enzymes.

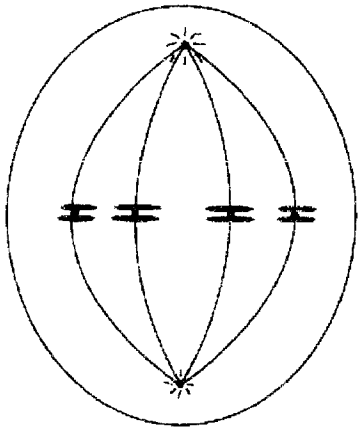
10 The following events occur during the cell cycle.

i formation of mRNA
ii thickening of chromosomes
iii peptide bond formation

Which of these events occur during interphase?

A i, ii and iii
B i and ii
C ii and iii
D i and iii

11 The diagram shows a cell dividing by mitosis at metaphase.



How many DNA strands will be present at the end of telophase in each cell?

A 4
B 8
C 12
D 16

12 When preparing a root tip squash, the root tips are boiled in hydrochloric acid to

A break the middle lamella.
B fix the roots tips.
C inhibit cell division temporarily.
D remove the fixative from the root tips.

13 Which is true about the direction of the coding and non-coding strand of DNA?

	coding strand	non-coding strand
A	5′ → 3′	3′ → 5′
B	3′ → 5′	5′ → 3′
C	5′ → 3′	5′ → 3′
D	3′ → 5′	3′ → 5′

14 How many different amino acids are coded for by a mRNA molecule with 21 nucleotides?

A 6
B 7
C 21
D 42

15 A coding strand of DNA has the sequence

TTG CTA GCC

The complementing strand of mRNA with a single base substitution is

A UUC GUT CGA.
B AAC GAT CGA.
C AGC GAU CGG.
D AAC GAU CGG.

16 A transformed cell is one that

A can take in foreign DNA.
B changes structure after taking in foreign DNA.
C outcompetes other cells in mixtures of cells.
D has acquired foreign DNA.

17 The approximate length of a complete DNA molecule turn is

A 0.34 nm.
B 2 nm
C 3.4 nm.
D 10 nm.

18 The proportion of dominant to recessive characteristics in a population will remain the same if

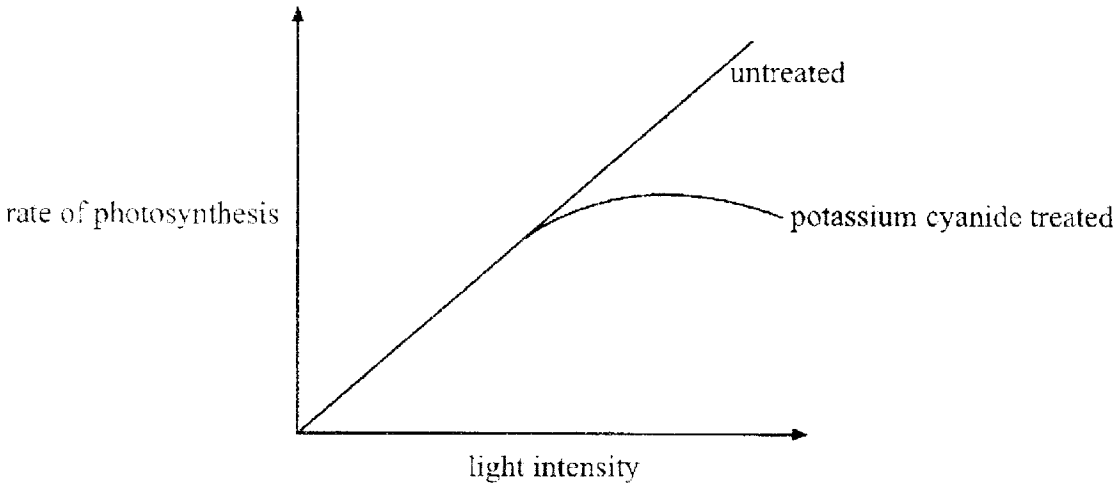
A artificial selection takes place.
B natural selection takes place.
C the population is small.
D random mating occurs.

19 In a certain species of plants, the density of hairs on the lower epidermis of the leaf is thought to be controlled by a single pair of alleles which are co-dominant.

What is the maximum number of different hair densities if the environmental factors have no influence?

A 1
B 2
C 3
D 4

20 The graph shows the effect of the introduction of potassium cyanide on the rate of photosynthesis of *Chlorella* at different light intensities.



What can be deduced from the graph?

A Potassium cyanide inhibits photosynthesis at lower light intensities.
B Potassium cyanide inhibits photosynthesis at higher light intensities.
C Potassium cyanide has no inhibiting effect on photosynthesis at higher light intensities.
D Potassium cyanide absorbs more light at higher light intensities.

21 The first product of photosynthesis is

A ATP
B NADP
C TP
D GP

22 Which is not a feature of xylem?

A lignified
B sieve plate
C narrow lumen
D pitted

23 What are the changes that occur to a tree branch at a high rate of transpiration?

A increase in suction pressure increases and increase in diameter
B decrease in suction pressure and increase in diameter
C increase in suction pressure and reduction in the diameter
D decrease in suction pressure and decrease in diameter

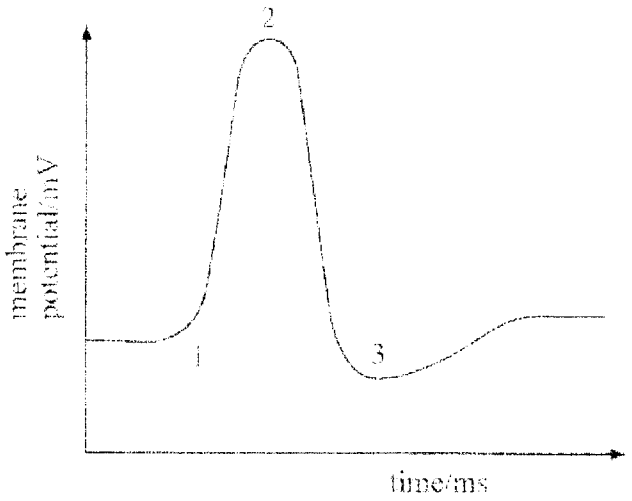
24 Which pathway(s) allow water to pass through the endodermis?

A apoplast and vacuolar
B apoplast and symplast
C symplast only
D symplast and vacuolar

25 How many oxygen atoms can a red blood cell with 30 haemoglobin molecules carry?

A 30
B 60
C 120
D 240

26 The diagram shows an action potential.



Which event is occurring at 3?

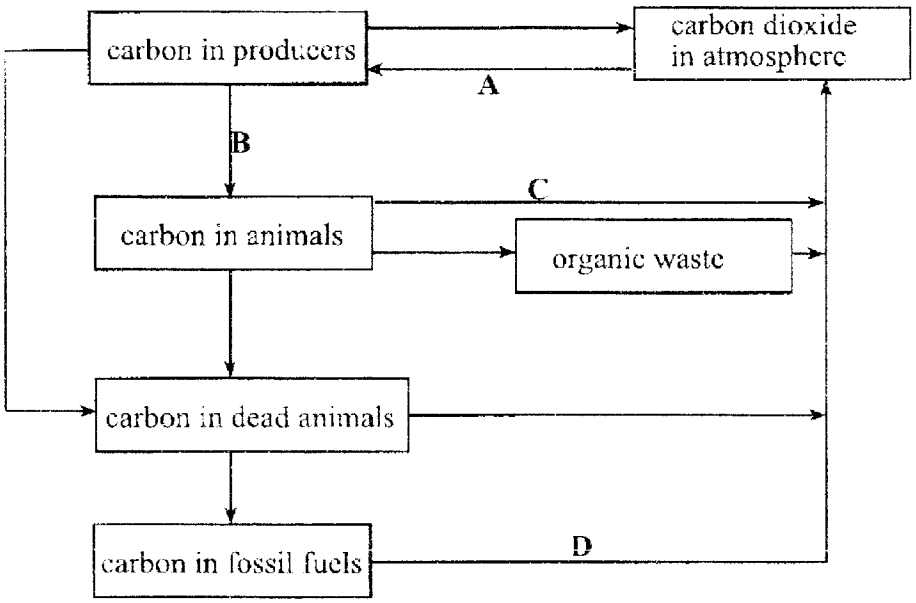
A Na^+ gates open
B K^+ gates open
C influx of K^+
D outflux of Na^+

27 What is the source of the pressure for the formation of glomerular filtrate in the kidney nephron?

A cardiac muscle in the left ventricle
B elastic tissue in the renal artery
C cardiac muscle in the right ventricle
D mitochondria in the cells of the Bowman's capsule

28 The diagram summarises the carbon cycle.

Which stage represents ingestion?



29 In an ecosystem, which organisms are decomposers?

A earthworm
B beetles
C microorganisms
D snails

30 The diagram shows energy flow in a garden food chain.

At which stage is the energy transfer most efficient?

sun —A→ cabbage —B→ caterpillar —C→ sparrow —D→ eagle

31 Inbreeding in plants is prevented by

A dioecity.
B protogyny.
C protandry.
D incompatibility.

32 Which hormone promotes root growth?

A abscisic acid
B gibberellic acid
C ethylene
D auxin

33 During the menstrual cycle, which hormone is produced by the pituitary gland in response to gonadotrophin releasing hormone?

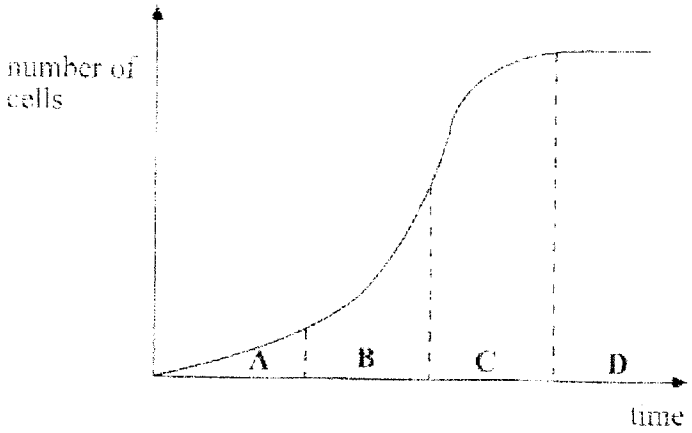
A interstitial cell stimulating hormone
B luteinising hormone
C oestrogen
D progesterone

34 If fertilisation of the mammalian ovum fails,

A the corpus luteum will not disintegrate.
B progesterone secretion will increase.
C oestrogen secretion will increase.
D the primary follicle will not develop.

35 The diagram shows a typical growth curve in bacteria.

During which stage is the number of cells doubling after each generation?



36 An isometric growth pattern is observed in

A fish.
B humans.
C tomatoes.
D pine trees.

37 The following changes occur in the ovary during the menstrual cycle.

1 follicles develop
2 progesterone is produced
3 ovulation occurs
4 corpus luteum forms

In which sequence do these changes occur?

A 3, 1, 4, 2
B 3, 2, 4, 1
C 1, 3, 4, 2
D 1, 4, 2, 3

38 Algae is similar to plants because it

A is multicellular.
B contains chloroplasts.
C detects and swims towards light.
D possesses a flagellum.

39 Using the binomial system, which of the following is the correct way of naming the African elephant?

A *loxodonta africana*
B *loxodonta Africana*
C *Loxodonta Africana*
D *Loxodania africana*

40 Mosses are characterised by a dominant

A gametophyte with a dependent sporophyte.
B gametophyte with an independent sporophyte.
C sporophyte with an independent gametophyte.
D sporophyte with gametophyte reduced to a few cells.