



ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Advanced Level

BIOLOGY

6030/1

PAPER 1 Multiple Choice

NOVEMBER 2022 SESSION

1 hour

Additional materials:

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)
- Electronic calculator

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

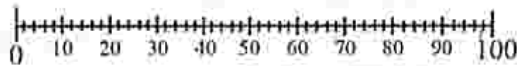
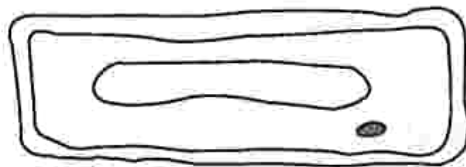
Each correct answer will score **one** mark. A mark will **not** be deducted for a wrong answer.

Any rough working should be done in this booklet.

This question paper consists of 9 printed pages and 3 blank pages.

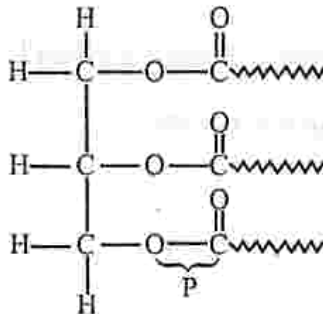
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- 1 What is the function of glycoproteins in cell membranes?
- A control membrane fluidity
 B transport molecules across the membrane
 C recognition sites for antigens
 D barrier to most molecules
- 2 Which statement, about resolution, is **not** true?
- A Increases depth of detail of specimen.
 B Increases with decrease in wave length.
 C Is higher in light microscopes.
 D Is higher in electron microscopes.
- 3 In a calibrated eyepiece graticule, a single division measures $2.5\mu\text{m}$.
 What is the size of the nucleus of the cell shown in the diagram?



25

- A $7.5\mu\text{m}$
 B $15\mu\text{m}$
 C $92\mu\text{m}$
 D $230\mu\text{m}$
- 4 The diagram shows the structure of a biological molecule.



What is bond P?

- A ester
 B peptide
 C glycosidic
 D phosphodiester

5 Biological washing powders are more effective at

- A warm temperature.
- B low pH.
- C high pH.
- D cold temperature.

6 Which statement is true for **all** enzymes?

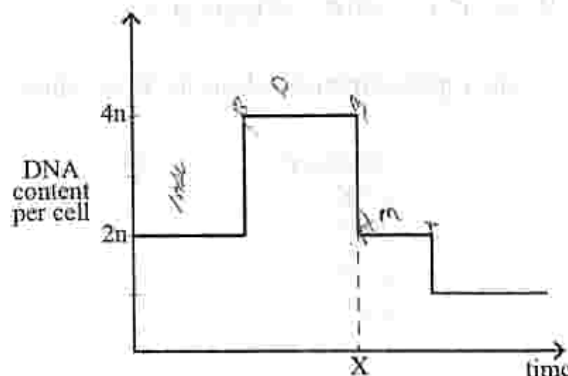
- A they are affected by competitive inhibitors
- B they are part of catabolic reactions
- C they are coded for by DNA
- D they are active inside cells

7 A parent cell dividing by mitosis had 14 chromosomes.

How many chromosomes will each daughter cell have after mitosis?

- A 7
- B 14
- C 21
- D 28

8 The graph shows the of amount of DNA in a cell during meiosis.



Which stage is represented at time X?

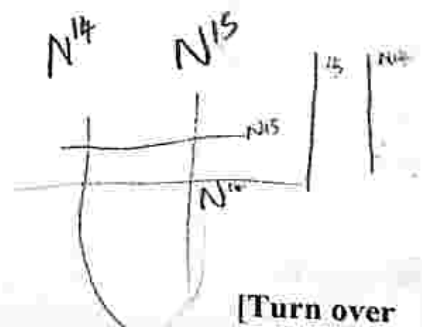
- A anaphase I
- B anaphase II
- C telophase I
- D telophase II

PMAT

9 A culture of DNA containing the N^{14} isotope was grown in a medium containing the heavy N^{15} isotope.

What is the percentage of the N^{15} in the second generation.

- A 25%
- B 50%
- C 75%
- D 100%



10 Which pair of enzymes are involved in DNA replication?

- A ligase and endonuclease
- B helicase and polymerase
- C polymerase and endonuclease
- D helicase and endonuclease

11 A section of DNA was analysed and 24% of its bases was adenine.

How much of the DNA was cytosine?

$$\begin{array}{r} A \quad T \\ 24\% \quad 24\% \end{array}$$

- A 24%
- B 26%
- C 52%
- D 76%

$$= \frac{48}{2}$$

12 The condition in which two alleles equally express themselves in the phenotype is

- A sex linkage.
- B co-dominance.
- C complete dominance.
- D multiple allelomorphism.

13 A girl is blood group B and her brother is blood group A.

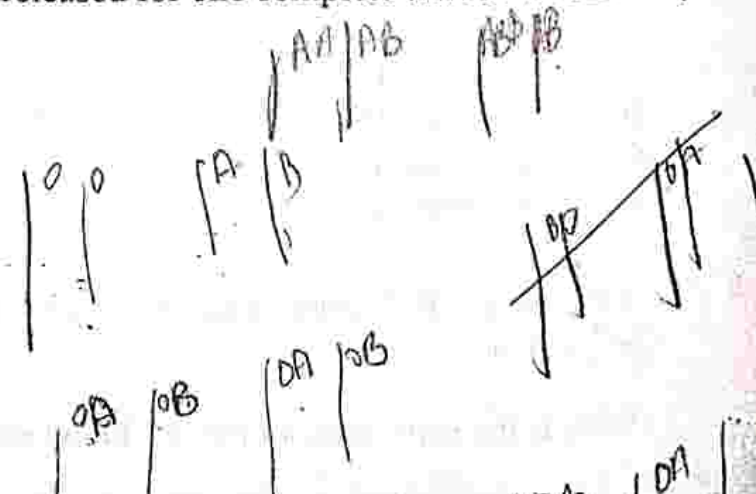
Which combination of genotypes **cannot** belong to their parents?

	father	mother
A	$I^B I^O$	$I^A I^A$
B	$I^A I^B$	$I^A I^B$ ✓
C	$I^O I^O$	$I^A I^B$
D	$I^B I^O$	$I^A I^O$



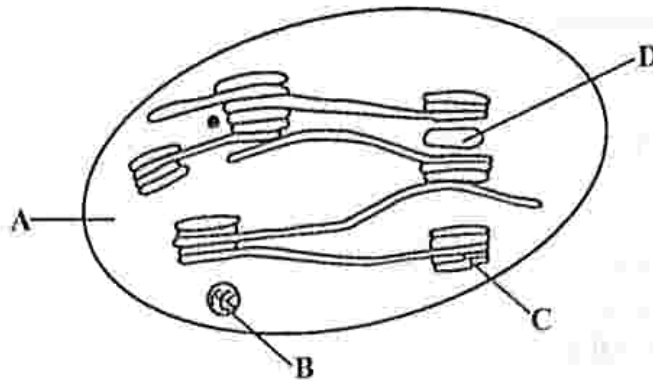
14 How many carbon dioxide molecules are released for one complete turn of the Krebs cycle?

- A 2
- B 4
- C 6
- D 8



15 The diagram shows the structure of a chloroplast.

In which part, A, B, C or D, is reduced NADP oxidised?



16 Which substance acts as the hydrogen acceptor in animals under anaerobic conditions?

- A ethanal
- B coenzyme A
- C pyruvate
- D lactate

17 The following statements describe a blood vessel.

no semi-lunar valves (except where it leaves heart)
 transports blood away from the heart
 thick tunica media
 high blood pressure

Which blood vessel best suits the description?

- A vein
- B artery
- C capillary
- D venule

18 Coronary heart disease is **least** prevalent in

- A Sub-Saharan Africa
- B South East Asia
- C Eastern Europe
- D North America

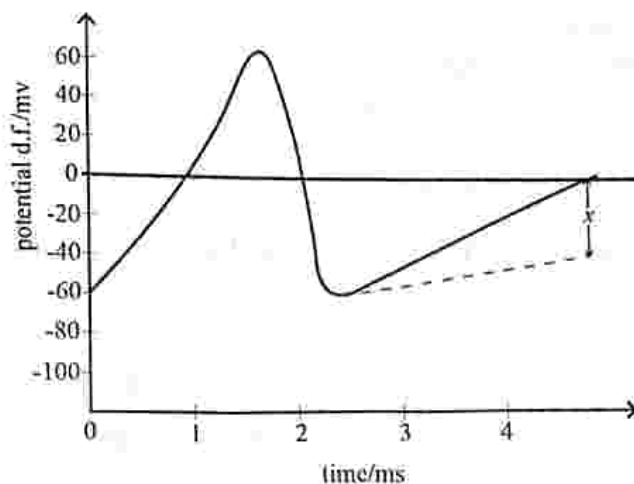
19 Where is the mammalian heart beat initiated?

- A atrioventricular node
- B left atrium
- C sinoatrial node
- D Purkyne tissue

- 20 Which one is **not** a factor for tuberculosis in developing countries?
- A longevity
 - B malnutrition
 - C immunosuppression
 - D overcrowding
- 21 Ebola is prevalent in
- A West Africa.
 - B Eastern Europe.
 - C South East Asia.
 - D Sub-Saharan Africa
- 22 Which enzyme is **not** used in the production of insulin by genetic engineering?
- A restriction endonuclease
 - B reverse transcriptase
 - C RNA polymerase
 - D DNA ligase
- 23 Analysis of a person's DNA to check for the presence of a particular allele is called
- A gene technology.
 - B gene therapy.
 - C genetic screening.
 - D genetic engineering.
- 24 Which one is **not** an advantage of gene technology?
- A Offspring production can be controlled.
 - B Development can be copyrighted.
 - C Sexual reproduction is not necessary.
 - D Genes for desirable characteristics can be cloned.
- 25 The 'dub' sound in the cardiac cycle is produced during
- A arterial systole.
 - B arterial diastole.
 - C ventricular systole.
 - D ventricular diastole.



- 26 The graph shows changes in the axon during propagation of a nerve impulse.



Which ion is largely responsible for the region x ?

- A Na^+
 B K^+
 C Cl^-
 D Ca^{2+}
- 27 After ovulation
- A the polar body starts to release progesterone.
 B the Graafian follicle develops another ovum.
 C oogenesis is completed if fertilisation occurs.
 D the ovum will divide into a ball of cells.
- 28 The number of spermatids produced from a single spermatogonium is
- A one.
 B two.
 C four.
 D eight.
- 29 The list shows hormones produced during the menstrual cycle:

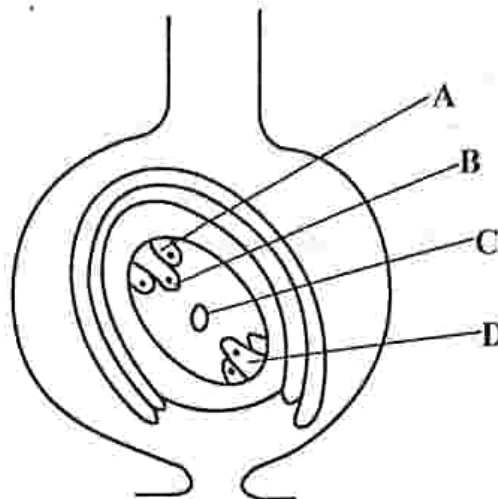
- 1 Folide Stimulating Hormone (FSH)
- 2 Progesterone
- 3 Luteinizing hormone (LH)
- 4 Oestrogen

What is the correct order of release of the hormones?

- A 2 1 3 4+
- B 1 4 3 2
- C 4 3 2 1+
- D 3 4 1 2

- 30 What is the role of hyaluronidase enzyme during acrosome reaction?
- A Remove the zona pellucida.
 - B Stored for future use.
 - C Digest a path through the granulosa cells.
 - D Aids in the movement of sperm.

- 31 The diagram shows part of the carpel from a mature flower.
Which part, A, B, C or D, will form the zygote after fertilization?



- 32 What is the role of parathormone?
- A increase blood Ca^{2+} levels
 - B decrease blood Ca^{2+} levels
 - C for hormone replacement therapy
 - D reduces effects of premenstrual tension
- 33 Which ecological unit has the greatest competition?
- A ecosystem \times
 - B community $-$
 - C habitat $+$
 - D niche $-$
- 34 Nitrogen fixing bacteria contributes to the nitrogen cycle by
- A returning nitrogen to the atmosphere.
 - B changing nitrogen to ammonium.
 - C converting ammonia to nitrate.
 - D returning nitrogen to autotrophs.
- 35 Which one is **not** a general characteristic of eutrophication?
- A Presence of algae. ec
 - B Presence of blue-green bacteria. ec
 - C High biological oxygen demand. ec
 - D High species diversity.

36 Which sequence shows the descending order of levels of organisation?

- A population → community → ecosystem → biosphere
- B biosphere → ecosystem → community → population †
- C community → population → biosphere → ecosystem
- D ecosystem → biosphere → community → population †

37 Which is **not** a socio-economic importance of the kingdom animalia?

- A tourism *AN*
- B food *AN*
- C fermentation *AN*
- D hunting *DIS*



38 Which is a diagnostic feature of the phylum Echinodermata?

- A triploblastic
- B no head
- C tube feet
- D calcareous exoskeleton

39 Which one is the correct taxonomic hierarchy?

- A kingdom, phylum, class, order, family, genus, species.
- B kingdom, class, phylum, order, family, genus, species.
- C kingdom, phylum, order, family, class, genus, species.
- D kingdom, phylum, class, family, order, genus, species.

KPCOPGS

40 Which is **not** an importance of prokaryotes?

- A Bio-technology
- B Decomposition
- C Fermentation
- D Penicillin production



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