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BIOLOGY
STANDARD LEVEL
PAPER 1

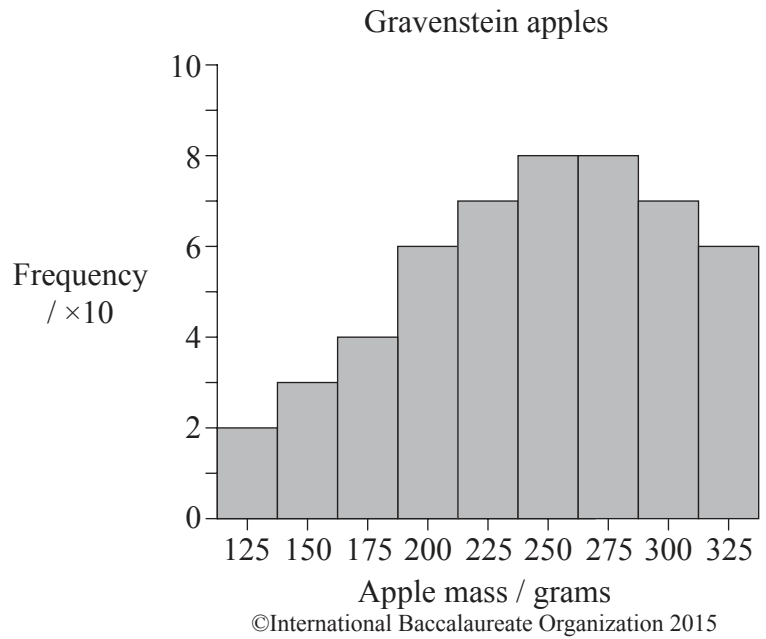
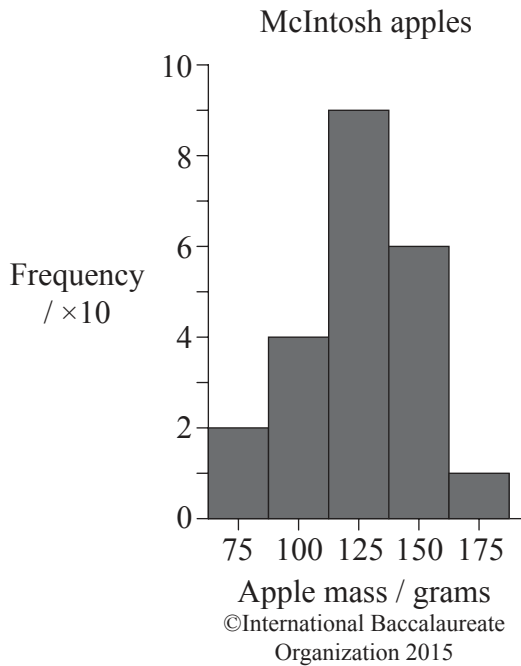
Monday 10 November 2014 (afternoon)

45 minutes

INSTRUCTIONS TO CANDIDATES

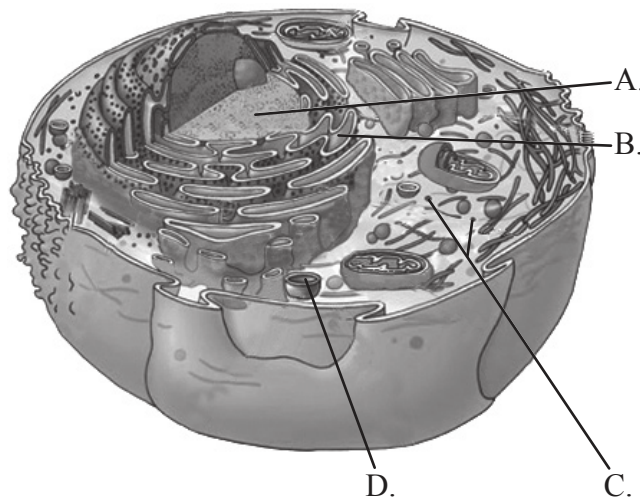
- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- The maximum mark for this examination paper is *[30 marks]*.

1. What can be predicted from the histogram comparing the mass of McIntosh apples and the mass of Gravenstein apples?



- A. More fertiliser had been used to grow the McIntosh apples.
- B. The mass of the McIntosh apples has a smaller standard deviation than the Gravenstein apples.
- C. The electronic balance used to obtain the data was only accurate to 5 grams.
- D. The distribution of the two apple masses overlaps by 68%.
2. What evidence supports the cell theory?
- A. Living organisms are made up of cells.
- B. Unicellular organisms carry out all the functions of life.
- C. Multicellular organisms show emergent properties.
- D. Cells can develop from inorganic molecules.

3. What is a difference between prokaryotic cells and eukaryotic cells?
- A. Ribosomes are found only in prokaryotic cells.
 - B. Cell walls are found only in eukaryotic cells.
 - C. Mitochondria are found only in eukaryotic cells.
 - D. Flagella are found only in prokaryotic cells.
4. What causes cell differentiation in multicellular organisms?
- A. Each cell having different genes.
 - B. The expression of certain genes but not others.
 - C. The recognition by antibodies of some cells but not others.
 - D. The cellular recognition of a specific function.
5. Which structure synthesizes proteins for use primarily within the cell?



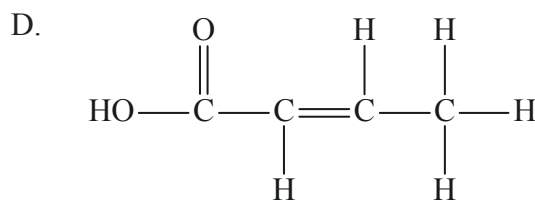
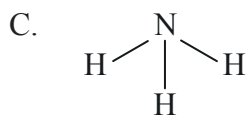
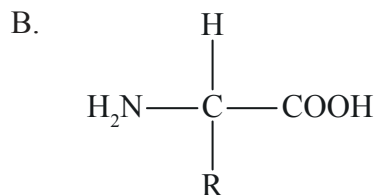
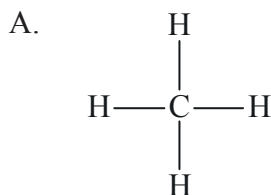
[Source: adapted from [http://faculty.irsc.edu/FACULTY/TFischer/images/cell organelles.png](http://faculty.irsc.edu/FACULTY/TFischer/images/cell%20organelles.png)]

6. What is the passive movement of particles, such as sodium ions from an area of higher concentration to an area of lower concentration through a protein carrier?
- A. Diffusion
 - B. Osmosis
 - C. Facilitated diffusion
 - D. Active transport
7. What characteristic(s) of water allow(s) effective transport of nutrients around the body by blood?
- I. Solvent properties
 - II. Thermal capacity
 - III. Transparency
- A. I only
 - B. I and II only
 - C. II and III only
 - D. I, II and III
8. How can a change in pH stop an enzyme-catalysed reaction from occurring?
- A. Collisions between enzyme and substrate are prevented.
 - B. The structure of the enzyme is altered.
 - C. There is too much product produced.
 - D. The active site is blocked by the substrate.
9. During which process is messenger RNA (mRNA) formed?
- A. Translocation
 - B. Transcription
 - C. Translation
 - D. Transmission

10. What is the correct site of anaerobic respiration in yeast and one of its end products?

	Site	End product
A.	cytoplasm	pyruvate
B.	cytoplasm	ethanol
C.	matrix	lactate
D.	matrix	carbon dioxide

11. Which compound is inorganic?



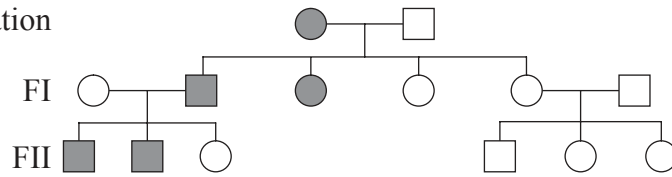
12. What is light energy used for in photosynthesis?

- A. To absorb carbon dioxide.
- B. To split water molecules.
- C. To oxidize organic compounds.
- D. To make oxygen and hydrogen react.

13. After chorionic villus sampling, how is the material processed for karyotyping?
- A. DNA is fingerprinted.
 - B. Genes are photographed.
 - C. Alleles are compared.
 - D. Homologous chromosomes are paired.
14. When could non-disjunction occur?
- A. Prophase
 - B. Meiosis
 - C. Interphase
 - D. Cytokinesis
15. A purple-flowered plant of dominant phenotype is crossed with a white-flowered homozygous recessive plant. If there are many offspring and they are all purple, what is the genotype of the purple-flowered parent plant?
- A. Homozygous dominant
 - B. Homozygous recessive
 - C. Heterozygous
 - D. Codominant

16. What are the genotypes of the parental generation?

Parental generation

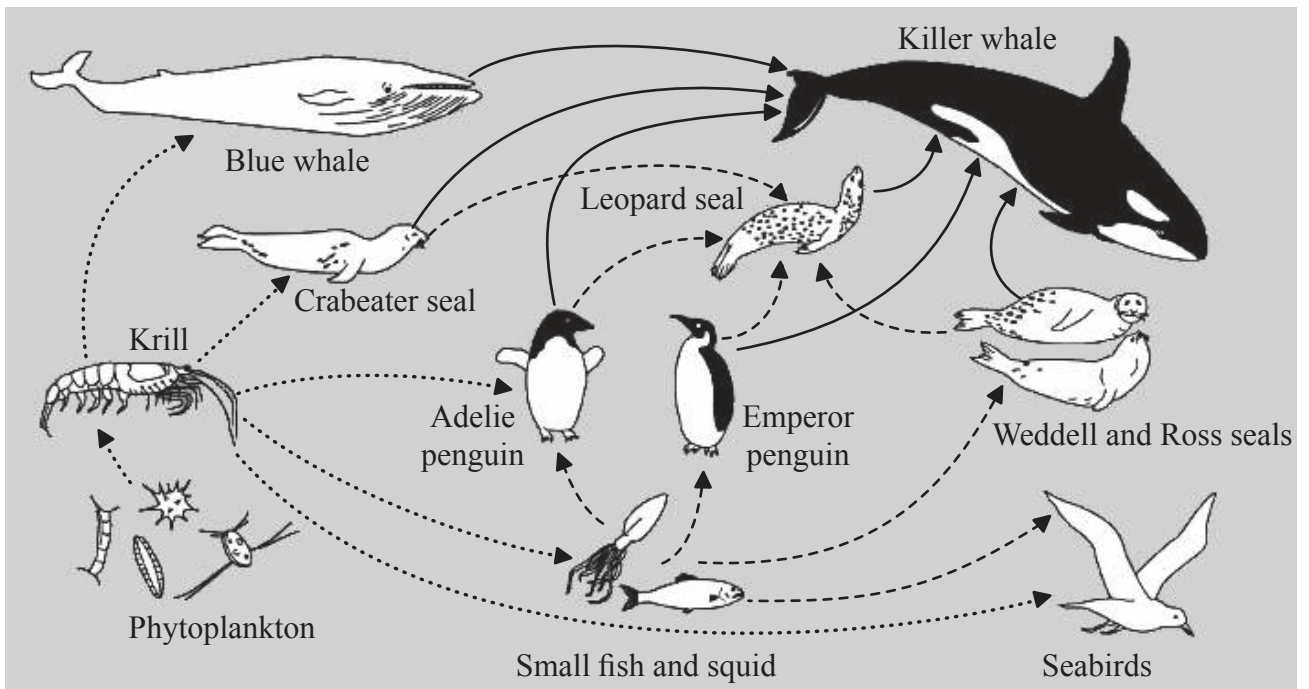


Key:

- male with trait
- female with trait
- male without trait
- female without trait

- A. Male is homozygous dominant and female is homozygous recessive.
 - B. Male is heterozygous and female is homozygous dominant.
 - C. Male is homozygous recessive and female is homozygous dominant.
 - D. Male is homozygous recessive and female is heterozygous.
17. If a woman has three male offspring, what is the probability that her next child will be female?
- A. 25%
 - B. 50%
 - C. 75%
 - D. 100%
18. After gene transfer between species, what ensures that the amino acid sequence of the polypeptide made using the transferred gene remains unchanged?
- A. The genetic code is semi-conservative.
 - B. The genetic code is degenerate.
 - C. The genetic code is universal.
 - D. The genetic code can be cloned.

19. What is the trophic level of the Leopard seal?



[Source: adapted from <http://amurdoch.tripod.com/yr4/AntFoodWeb.JPG>]

- I. Secondary consumer
 - II. Tertiary consumer
 - III. Quaternary consumer
-
- A. II only
 - B. III only
 - C. II and III only
 - D. I, II and III

20. In the carbon cycle, which pair shows the correct change in atmospheric composition?

	Increases CO₂ in the atmosphere	Decreases CO₂ in the atmosphere
A.	cell respiration	combustion
B.	photosynthesis	fossilization
C.	combustion	photosynthesis
D.	fossilization	cell respiration

21. In ecology, how is community defined?

- A. Different species living and interacting with each other in a specific area.
- B. Different families cooperating with each other.
- C. A group of organisms of the same species who live in a specific area at the same time.
- D. A specific area in which a group of species normally live.

22. Which comparable features provide evidence for evolution?

- A. The rear legs of a kangaroo and a grasshopper.
- B. The wings of a myna bird and a butterfly.
- C. The forearms of a human and fins of a whale.
- D. The fur of a bear and a wolf.

23. What is the phylum of the organism?



[Source: adapted from <http://media.web.britannica.com/eb-media/55/28355-004-64219017.jpg>]

- A. Porifera
 - B. Cnidaria
 - C. Platyhelminthes
 - D. Annelida
24. Colonic irrigation involves regularly flushing the large intestine with water. Why should this practice be avoided?
- A. The large intestine absorbs water.
 - B. Vitamin-producing bacteria are eliminated.
 - C. It will stimulate the production of toxins.
 - D. Undigested remains of food are removed.
25. Which vessel carries deoxygenated blood from the heart to the lungs?
- A. Vena cava
 - B. Coronary vein
 - C. Pulmonary artery
 - D. Pulmonary vein

26. What role does the medulla of the brain have in controlling heart rate?
- A. To secrete adrenaline to speed up the heart.
 - B. To stimulate myogenic heart muscle contraction.
 - C. To block pacemaker activity.
 - D. To adjust heart rate to changing blood pressure.
27. Which is a long-term effect of the human immunodeficiency virus (HIV) on the immune system?
- A. Fewer bacterial infections
 - B. Fewer active lymphocytes
 - C. More antibody production
 - D. More antigen recognition
28. During expiration, how does air pressure in the lungs compare with atmospheric pressure?
- A. Lung air pressure is greater than atmospheric pressure.
 - B. Lung air pressure is less than atmospheric pressure.
 - C. Lung air pressure starts below atmospheric pressure and rises above it.
 - D. Lung air pressure starts above atmospheric pressure and falls below it.
29. Where do motor neurons conduct impulses from and to?
- A. From effectors to the central nervous system.
 - B. From receptors to the central nervous system.
 - C. From neurons to other neurons.
 - D. From the central nervous system to effectors.

30. What are increasing levels of progesterone responsible for during the female menstrual cycle?
- A. Stimulating ovulation
 - B. Development of the follicle
 - C. Thickening of the endometrium
 - D. Menstruation
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