

Advanced Biology Quantitative and Historical Facts

Advanced Biology · Practice Test · 15 Questions

1. In what year did James Watson and Francis Crick publish their seminal paper 'Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid' in the journal Nature?

- A) 1951
- B) 1953
- C) 1955
- D) 1957

2. The average diameter of a double-stranded DNA helix is approximately how many nanometers?

- A) 0.5 nm
- B) 1.0 nm
- C) 2.0 nm
- D) 3.4 nm

3. In the 1961 experiment by Marshall Nirenberg and Heinrich Matthaei, which synthetic RNA homopolymer was used to demonstrate that the codon 'UUU' codes for phenylalanine?

- A) Poly-A
- B) Poly-U
- C) Poly-C
- D) Poly-G

4. How many turns of the Calvin cycle are required to produce one net molecule of glyceraldehyde-3-phosphate (G3P)?

- A) 2
- B) 3
- C) 6
- D) 12

5. The enzyme RuBisCO consists of how many large subunits and how many small subunits in most higher plants?

- A) 4 large, 4 small
- B) 8 large, 8 small
- C) 6 large, 6 small
- D) 2 large, 2 small

6. Which scientist first described the process of transformation in *Streptococcus pneumoniae* in a 1928 paper?

- A) Oswald Avery
- B) Frederick Griffith
- C) Colin MacLeod
- D) Maclyn McCarty

7. What is the approximate molecular mass of an average amino acid residue in a protein, often cited as a standard for estimation?

- A) 110 Daltons
- B) 150 Daltons
- C) 220 Daltons
- D) 500 Daltons

8. In 1952, the Hershey-Chase experiment used which radioactive isotope to label the DNA of bacteriophage T2?

- A) Sulfur-35
- B) Carbon-14
- C) Phosphorus-32
- D) Nitrogen-15

9. How many ATP molecules are generated from the complete oxidation of one molecule of glucose in a eukaryotic cell, according to the modern accepted range including shuttle costs?

- A) 28-30
- B) 36-38
- C) 30-32
- D) 40-42

10. The mitochondrial genome in humans consists of approximately how many base pairs?

- A) 16,569 bp
- B) 10,240 bp
- C) 22,100 bp
- D) 5,000 bp

11. Barbara McClintock was awarded the Nobel Prize in Physiology or Medicine in 1983 for her discovery of what?

- A) Telomeres
- B) Mobile genetic elements
- C) Restriction enzymes
- D) Spliceosomes

12. During the cell cycle, the 'Restriction Point' (R point) where a cell becomes committed to the S phase occurs during which sub-phase?

- A) G0
- B) G1
- C) S
- D) G2

13. The enzyme telomerase is a ribonucleoprotein that contains an essential RNA component. What is the name of this RNA template in humans?

- A) hTR
- B) hTERT
- C) TERC
- D) Both a and c

14. How many hydrogen bonds form between a guanine-cytosine base pair in a DNA double helix?

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

15. In 1974, which two researchers shared a Nobel Prize for the discovery of the structure and function of the ribosome?

- A) Palade and Porter
- B) Claude and de Duve
- C) Sanger and Gilbert
- D) None of these