

This examination paper consists of 4 pages.

Appendices: none

Permitted materials: none

The number of answers for each question must match the number shown in brackets to the right.

1. Nucleosomes

- contain mostly ribosomal RNA
 - are present in bacteria
 - contain histones
 - are building blocks of DNA
 - disappear during meiosis
- (1)

2. Organelle genomes

- are always circular
 - replicate independently from nuclear genomes
 - are much smaller than nuclear genomes
 - are normally not highly expressed
 - exist in one copy per organelle
 - are normally split into several chromosomes
- (2)

3. The bulk of RNA in cells is

- non-coding RNA
 - coding RNA
 - mRNA
 - transfer RNA
 - small nuclear RNA
 - ribosomal RNA
- (2)

4. Operons

- are characteristic for eukaryotic genomes
 - contain more than one gene
 - contain more than one promoter
 - contain always similar genes
 - contain almost no intergenic sequences
- (2)

5. Microarrays

- are used in proteome analysis
 - are used in transcriptome analysis
 - are used to identify microsatellites
 - are used to identify homologous sequences
 - are present in eukaryotic genomes
- (2)

6. Chromosome walking

- occurs during meiosis
- occurs during mitosis
- is a sequencing technique
- is only found in eukaryotes
- is used to disrupt genes
- uses clone libraries (1)

7. The following elements are classified as interspersed repeats

- telomeres
- long terminal repeats
- microsatellites
- pseudogenes
- DNA transposons
- retrotransposons
- centromeres (3)

8. Chaperons are involved in

- translation
- transcription
- protein degradation
- polypeptide folding
- RNA degradation
- mRNA processing (1)

9. Multigene families consist of

- genes clustered on one chromosome
- genes coding for different subunits of a protein
- genes of similar or identical sequences
- genes coding for proteins of the same biochemical pathway (1)

10. Components of ribonucleic acids are

- glucose
- phosphate
- ribose
- uracil
- adenine
- thymine
- glycerol
- deoxyribose
- nucleotides (5)

11. The DNA double helix is stabilized by

- ionic bonds
 - covalent bonds
 - hydrogen bonds
 - hydrophobic interactions
 - disulfide bridges
- (2)

12. Partial linkage

- was discovered by Gregor Mendel
 - is the basis of physical mapping
 - is found for sequences on different chromosomes
 - is caused by crossover events
- (1)

13. A genome map

- shows all genome markers
 - shows all the genes in a genome
 - shows all the restriction sites in a genome
 - shows all the microsatellites in a genome
 - is made at the end of a genome sequencing project
- (1)

14. Genetic mapping

- is less accurate than physical mapping
 - uses ESTs (expressed sequence tags)
 - uses clone libraries
 - uses FISH (fluorescent in situ hybridization)
- (1)

15. Which of the following genomes is richest in interspersed repeat sequences?

- Drosophila* genome
 - Human genome
 - Maize genome
 - Saccharomyces* genome
 - E. coli* genome
- (1)

16. Proteomes

- consist of histones and DNA
 - consist of proteases
 - consist of proteins
 - consist of ribosomal RNA
 - degrade proteins
- (1)

17. Open reading frames (ORFs)

- are gene sequences
 - are intergenic sequences
 - are usually shorter than 100 bp
 - contain introns
 - contain promoter sequences
- (1)

18. Reporter genes

- are used to identify coding regions
 - are used to identify introns
 - are used to identify regulatory sequences
 - do not code for proteins
 - code for ribosomal RNA
 - are visible genes
- (1)

19. Homology searching

- requires a DNA sequence
 - requires data banks
 - requires a complete genome sequence
 - requires a computer
 - requires a protein sequence
 - requires an RNA sequence
- (2)

20. Transformation

- converts DNA into RNA
 - converts RNA into proteins
 - joins two DNA fragments
 - introduces DNA into cells
 - removes genomes from cells
 - is used in cloning of DNA
- (2)