Quarter 1 Exam
Cellular and Molecular Biology

---

1. **Which of the following is NOT a characteristic of all living organisms?**
2. a) Growth and development
   b) Ability to move
   c) Response to stimuli
   d) Reproduction

3. **The scientific method begins with:**
   a) Forming a hypothesis
   b) Making an observation
   c) Conducting an experiment
   d) Analyzing data

3. **Which macromolecule is the primary source of energy for most organisms?**
   a) Proteins
   b) Lipids
   c) Carbohydrates
   d) Nucleic acids

4. **What is the monomer unit of proteins?**
   a) Monosaccharides
   b) Fatty acids
   c) Amino acids
   d) Nucleotides

5. **Enzymes speed up chemical reactions by:**
   a) Increasing temperature
   b) Lowering activation energy
   c) Changing reactants into products
   d) Adding more reactants

Quarter 1 Exam
Cellular and Molecular Biology

6. **Which factor does NOT affect enzyme activity?**
   a) Temperature
   b) pH
   c) Enzyme concentration
   d) The type of cell it is in

7. **Which organelle is responsible for producing ATP?**
   a) Nucleus
   b) Mitochondria
   c) Ribosome
   d) Golgi apparatus

8. **The rough endoplasmic reticulum is covered with:**
   a) Mitochondria
   b) Enzymes
   c) Ribosomes
   d) Lysosomes

9. **What type of transport requires energy?**
   a) Diffusion
   b) Osmosis
   c) Facilitated diffusion
   d) Active transport

10. **When a cell is placed in a hypertonic solution, it will:**
    a) Swell
    b) Shrink
    c) Stay the same
    d) Burst

Quarter 1 Exam
Cellular and Molecular Biology

11. **Which molecule captures light energy in photosynthesis?**
    a) Glucose
    b) ATP
    c) Chlorophyll
    d) Carbon dioxide

12. **The light-dependent reactions occur in the:**
    a) Stroma
    b) Thylakoid membrane
    c) Cytoplasm
    d) Mitochondria

13. **Cellular respiration occurs in the:**
    a) Nucleus
    b) Chloroplast
    c) Mitochondria
    d) Ribosome

14. **The main product of cellular respiration is:**
    a) Oxygen
    b) ATP
    c) Glucose
    d) Water

15. **Mitosis results in:**
    a) Two identical daughter cells
    b) Four haploid cells
    c) One large and one small cell
    d) Two genetically different cells

Quarter 1 Exam
Cellular and Molecular Biology

16. **During which phase of mitosis do chromosomes line up in the center of the cell?**
    a) Prophase
    b) Metaphase
    c) Anaphase
    d) Telophase

17. **The law of segregation states that:**
    a) Genes are inherited together
    b) Alleles separate during gamete formation
    c) DNA replication occurs before cell division
    d) A dominant allele always masks a recessive allele

18. **An organism with two identical alleles for a trait is:**
    a) Heterozygous
    b) Homozygous
    c) Dominant
    d) Recessive

19. **DNA is made of repeating units called:**
    a) Amino acids
    b) Nucleotides
    c) Fatty acids
    d) Monosaccharides

20. **The process of copying DNA is called:**
    a) Transcription
    b) Translation
    c) Replication
    d) Mutation

Quarter 1 Exam
Cellular and Molecular Biology

21. **What is the purpose of mRNA?**
    a) Store genetic information
    b) Carry genetic code from DNA to ribosome
    c) Transport amino acids
    d) Catalyze chemical reactions

22. **A person with the genotype XXY has:**
    a) Turner syndrome
    b) Down syndrome
    c) Klinefelter syndrome
    d) Cystic fibrosis

23. **What is the purpose of gel electrophoresis?**
    a) Clone DNA
    b) Separate DNA fragments
    c) Copy RNA
    d) Synthesize proteins

24. **In which phase of the cell cycle does DNA replication occur?**
    a) G1 phase
    b) S phase
    c) G2 phase
    d) M phase

25. **Meiosis results in:**
    a) Two diploid cells
    b) Four haploid cells
    c) Two genetically identical cells
    d) One large and one small cell

Quarter 1 Exam
Cellular and Molecular Biology

---

26. **Crossing over, which increases genetic variation, occurs during:**
    a) Prophase I of meiosis
    b) Metaphase I of meiosis
    c) Prophase of mitosis
    d) Telophase of meiosis

27. **The diploid number of chromosomes in humans is:**
    a) 23
    b) 46
    c) 44
    d) 22

28. **A heterozygous genotype consists of:**
    a) Two dominant alleles
    b) Two recessive alleles
    c) One dominant and one recessive allele
    d) Two different chromosomes

29. **A test cross is used to determine:**
    a) The genotype of an individual with a dominant phenotype
    b) The phenotype of an individual
    c) The number of chromosomes in a cell
    d) The DNA sequence of a gene

30. **If two heterozygous tall pea plants (Tt) are crossed, what percentage of the offspring will be short (tt)?**
    a) 0%
    b) 25%
    c) 50%
    d) 75%

Quarter 1 Exam
Cellular and Molecular Biology

31. **Which nitrogenous base is found in RNA but not in DNA?**
    a) Adenine
    b) Thymine
    c) Uracil
    d) Guanine

32. **Transcription takes place in the:**
    a) Ribosome
    b) Nucleus
    c) Cytoplasm
    d) Golgi apparatus

33. **The process of assembling a protein from an mRNA sequence is called:**
    a) Replication
    b) Transcription
    c) Translation
    d) Mutation

34. **The codon AUG codes for:**
    a) Stop
    b) Glycine
    c) Methionine (start)
    d) Threonine

35. **Gene expression is regulated by:**
    a) The order of amino acids
    b) The presence of regulatory proteins
    c) The number of ribosomes
    d) The length of the mRNA molecule

Quarter 1 Exam
Cellular and Molecular Biology

36. **What type of mutation does NOT change the amino acid sequence?**
    a) Missense mutation
    b) Nonsense mutation
    c) Silent mutation
    d) Frameshift mutation

37. **A person with the genotype XY is:**
    a) Male
    b) Female
    c) Affected by Turner syndrome
    d) Affected by Down syndrome

38. **What type of inheritance is shown when a red flower and a white flower produce pink offspring?**
    a) Codominance
    b) Incomplete dominance
    c) Multiple alleles
    d) Polygenic inheritance

39. **A pedigree is used to:**
    a) Sequence DNA
    b) Show patterns of inheritance in families
    c) Modify genes
    d) Determine blood type

40. **A person with blood type O has:**
    a) A and B antigens
    b) Only A antigens
    c) Only B antigens
    d) No A or B antigens

Quarter 1 Exam
Cellular and Molecular Biology

41. **What enzyme is used to cut DNA at specific sequences?**
    a) DNA polymerase
    b) Ligase
    c) Helicase
    d) Restriction enzyme

42. **What technique is used to amplify small amounts of DNA?**
    a) Gel electrophoresis
    b) PCR (Polymerase Chain Reaction)
    c) DNA sequencing
    d) Cloning

43. **Which of the following is an example of genetic engineering?**
    a) Selective breeding
    b) Using bacteria to produce insulin
    c) Natural selection
    d) DNA replication

44. **What is the purpose of CRISPR technology?**
    a) To copy DNA
    b) To edit genes
    c) To create new species
    d) To prevent mutations

45. **A genetically modified organism (GMO) is one that:**
    a) Has a mutation
    b) Has been selectively bred
    c) Has had its DNA altered
    d) Is naturally resistant to disease

Quarter 1 Exam
Cellular and Molecular Biology

46. **What is the basic unit of life?**
    a) Atom
    b) Molecule
    c) Cell
    d) Tissue

47. **Which organelle is found in plant cells but NOT in animal cells?**
    a) Mitochondria
    b) Nucleus
    c) Chloroplast
    d) Ribosome

48. **The main function of ribosomes is to:**
    a) Store genetic information
    b) Produce proteins
    c) Digest waste
    d) Transport nutrients

49. **The human genome consists of approximately:**
    a) 1,000 genes
    b) 10,000 genes
    c) 20,000 genes
    d) 100,000 genes

50. **The study of interactions between organisms and their environment is called:**
    a) Genetics
    b) Ecology
    c) Biochemistry
    d) Evolution

==========

Best wishes

Advanced Biology

Quarter 1 Exam

Answer sheet

	A	B	C	D
Q1	◯	◯	◯	◯
Q2	◯	◯	◯	◯
Q3	◯	◯	◯	◯
Q4	◯	◯	◯	◯
Q5	◯	◯	◯	◯
Q6	◯	◯	◯	◯
Q7	◯	◯	◯	◯
Q8	◯	◯	◯	◯
Q9	◯	◯	◯	◯
Q10	◯	◯	◯	◯
Q11	◯	◯	◯	◯
Q12	◯	◯	◯	◯
Q13	◯	◯	◯	◯
Q14	◯	◯	◯	◯
Q15	◯	◯	◯	◯
Q16	◯	◯	◯	◯
Q17	◯	◯	◯	◯
Q18	◯	◯	◯	◯
Q19	◯	◯	◯	◯
Q20	◯	◯	◯	◯
Q21	◯	◯	◯	◯
Q22	◯	◯	◯	◯
Q23	◯	◯	◯	◯
Q24	◯	◯	◯	◯
Q25	◯	◯	◯	◯

	A	B	C	D
Q26	◯	◯	◯	◯
Q27	◯	◯	◯	◯
Q28	◯	◯	◯	◯
Q29	◯	◯	◯	◯
Q30	◯	◯	◯	◯
Q31	◯	◯	◯	◯
Q32	◯	◯	◯	◯
Q33	◯	◯	◯	◯
Q34	◯	◯	◯	◯
Q35	◯	◯	◯	◯
Q36	◯	◯	◯	◯
Q37	◯	◯	◯	◯
Q38	◯	◯	◯	◯
Q39	◯	◯	◯	◯
Q40	◯	◯	◯	◯
Q41	◯	◯	◯	◯
Q42	◯	◯	◯	◯
Q43	◯	◯	◯	◯
Q44	◯	◯	◯	◯
Q45	◯	◯	◯	◯
Q46	◯	◯	◯	◯
Q47	◯	◯	◯	◯
Q48	◯	◯	◯	◯
Q49	◯	◯	◯	◯
Q50	◯	◯	◯	◯

Student Name: ----------

Class:----------