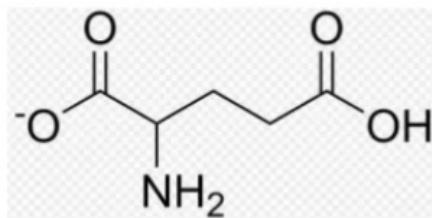


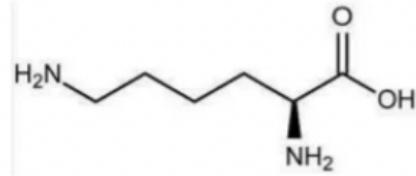
1. To which group does the amino acid glutamate belong?

- a. Polar
- b. Non-polar
- c. Positively charged
- d. Negatively charged
- e. Aromatic



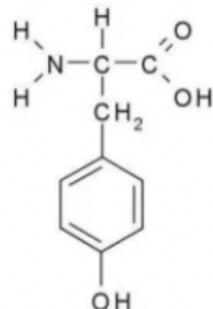
2. To which group does the amino acid lysine belong?

- a. Polar
- b. Positively charged
- c. Negatively charged
- d. Aromatic



3. To which group does the amino acid Tyrosine belong?

- a. Polar
- b. Non-polar
- c. Positively charged
- d. Negatively charged
- e. Aromatic



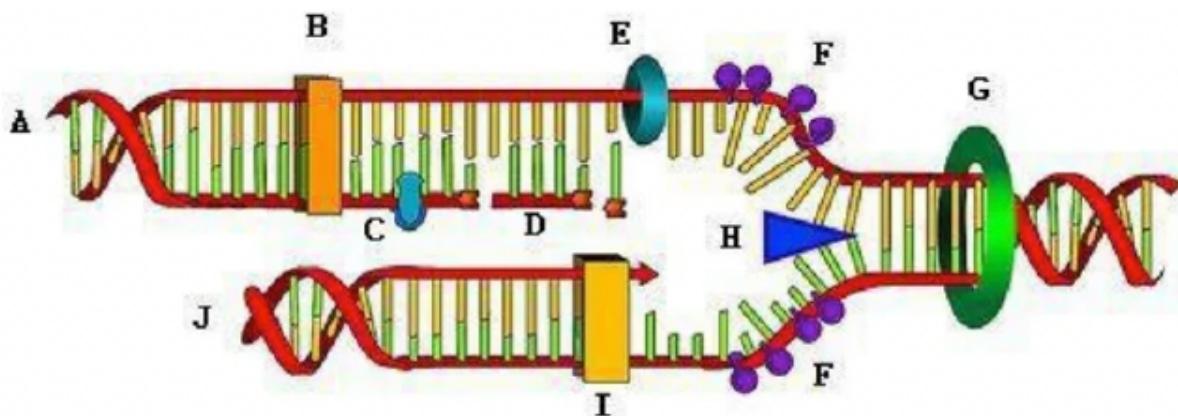
4. α -helix is a _____ structure of proteins:

- a. Primary
- b. Secondary
- c. Tertiary
- d. Quaternary

5. SS bridge (S-S bond) is covalent bond between amino acids of?

- a. Cysteine
- b. Methionine
- c. Aspartate
- d. Arginine

Questions 6-15 regard the following diagram



What letter best describes the following enzymes/structures at the previous diagram?

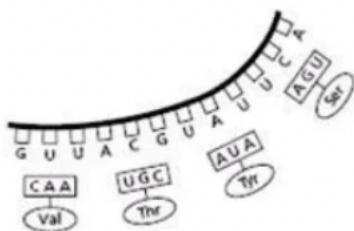
6. RNA primase –
 7. DNA ligase –
 8. DNA polymerase 1 -
 9. DNA polymerase 3 -
 10. Topoisomerase –
 11. Helicase –
 12. Leading strand –
 13. Lagging strand –
 14. Single strand binding proteins –
 15. Okazaki fragments –
16. What enzyme replaces RNA primer on the lagging strand with DNA?
- a. DNA polymerase III
 - b. DNA polymerase II
 - c. DNA polymerase I
 - d. RNA polymerase

17. What is produced during translation in Eukaryotes?

- a. DNA
- b. mRNA
- c. hnRNA
- d. Proteins
- e. Lipids

18. What process is being shown in the diagram

- a. Replication
- b. Translation
- c. Transcription
- d. Mutation



19. Using the genetic code table, what will be the amino acid sequence translated from the following mRNA:

5'---AUAUUUGCCAACUGC---3'

- A. NH₂—Met-Phe-Ala-His-Tyr---COOH
- B. NH₂—Phe-Thr-Ala-Asn-Gly---COOH
- C. NH₂—Ile-Phe-Ala-Asn-Cys---COOH
- D. NH₂—Ile-Tyr-Ala-Ala-Cys---COOH

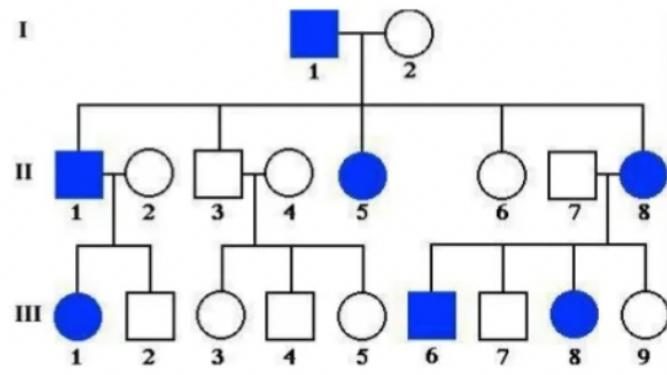
		Second letter					
		U	C	A	G		
First letter	U	UUU UUC UUA UUG } Phe	UCU UCC UCA UCG } Ser	UAU UAC UAA UAG } Tyr	UGU UGC UGA UGG } Cys	U C A G	Third letter
	C	CUU CUC CUA CUG } Leu	CCU CCC CCA CCG } Pro	CAU CAC CAA CAG } His	CGU CGC CGA CGG } Arg	U C A G	
	A	AUU AUC AUA AUG } Ile Met	ACU ACC ACA ACG } Thr	AAU AAC AAA AAG } Asn	AGU AGC AGA AGG } Ser	U C A G	
	G	GUU GUC GUA GUG } Val	GCU GCC GCA GCG } Ala	GAU GAC GAA GAG } Asp	GGU GGC GGA GGG } Gly	U C A G	

20. Consider two blood polymorphisms that humans have in addition to the ABO system. Two alleles L_M and L_N that determines the M, N and MN blood groups. The dominant allele R of different gene causes a person to be Rh+, whereas a homozygote for r is Rh-. From the evidence at the following table deduce the paternity of the 3 children

Person	Blood group		
Husband	O	M	Rh+
Wife's lover	AB	MN	Rh-
Wife	A	N	Rh+
Child 1	O	MN	Rh+
Child 2	A	N	Rh+
Child 3	A	MN	Rh-

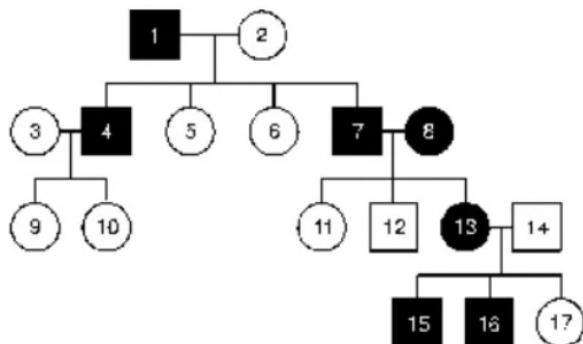
21. What is the mode of inheritance in the following pedigree?

- a. AR disease
- b. AD disease
- c. XR disease
- d. XD disease

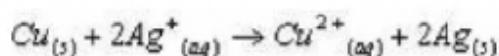


22. What is the mode of inheritance in the following pedigree?

- a. AR disease
- b. AD disease
- c. XR disease
- d. XD disease



23. An electric cell consist of silver electrode in 1M solution of AgNO₃ // and copper electrode in 1M solution of Cu(NO₃)₂. The reaction is at follow:



Which of the following does not take place?

- a. Electrons flows in the wire from the copper electrode to the silver electrode
- b. The silver electrode increase in mass as the cell operates
- c. There is a net movement of silver ions through the salt bridge from the silver half-cell to the copper half-cell.
- d. The copper electrode decrease in mass as the cell operates.

24. Balance the following reaction: (consider the amount of electrons)



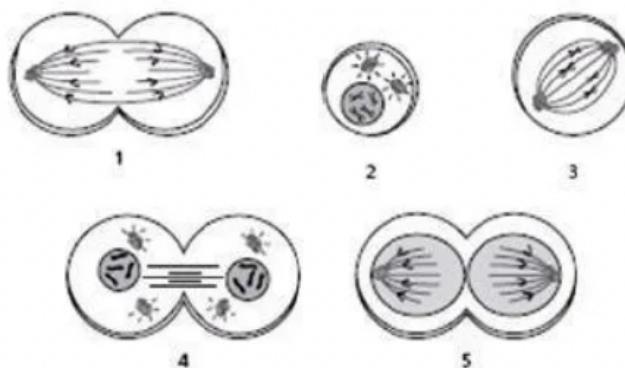
25. Considering the following reaction;



Which of the following is the oxidizing agent?

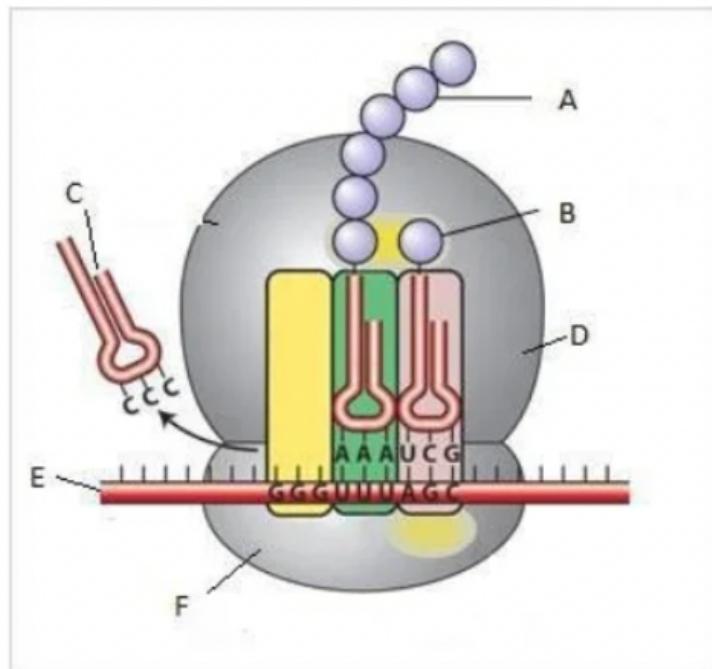
- a. N in HNO₃
- b. H⁺ in HCl
- c. Cl⁻ in HCl
- d. H⁺ in HNO₃

26. The stages of the cell cycle are shown in the random order in the diagrams below. What is the correct sequence of diagrams for the cell cycle (beginning with prophase)?



- a. 3,1,4,2,5
- b. 2,3,1,5,4
- c. 2,3,4,5,1
- d. 3,4,1,5,2
- e. 1,2,3,5,4

The following questions regards the following diagram:



27. What letter represents the peptide
28. What letter represents the amino acid
29. What letter represents the large ribosomal sub-unit
30. What letter represents the small ribosomal sub-unit
31. What letter represents the tRNA without an aminoacid
32. What letter represents the mRNA

33. Calculate the Emf of $\text{Zn}/\text{Zn}^{++} \text{0.1M} // 2\text{H}^{+}/\text{H}_2 \text{0.1M}$

$$\varepsilon^\circ = -0.76 \text{ V} \quad \varepsilon^\circ = 0 \text{ V}$$

- a. 0.73v
- b. 0.85v
- c. -0.73v
- d. 0.76v

34. Significance of hydrogen electrode.

35. Calculate the Emf of $\text{Fe}/\text{Fe}^{++} \text{0.1M} // \text{Cl}/\text{Cl}^{-} \text{0.1M}$

$$\varepsilon^\circ = -0.44 \text{ V} \quad \varepsilon^\circ = 1.36 \text{ V}$$

- a. 1.89v
- b. 1.72v
- c. 1.96v
- d. -1.89v

36. Describe pH relation to voltaic cell(formulas)

37. Describe ion conc. Relation to voltaic cell (Nernst equation)

38. Calculate the Zn conc. of $\text{Zn}/\text{Zn}^{++} // \text{Cl}/\text{Cl}^{-} \text{0.1M}$

- Emf= 2.21v
- a. 0.1M
 - b. 0.2M
 - c. 0.05M
 - d. 0.15M