

# Heredity Test- SSSS 2018 (Focus on DNA, RNA, and proteins)

**Answers are bolded and underlined.**

Starred problems (\*) are worth 2 points and double starred  
problems (\*\*) are worth 4 points!

Team Name: \_\_\_\_\_

Team Number: \_\_\_\_\_

Competitor Names: \_\_\_\_\_

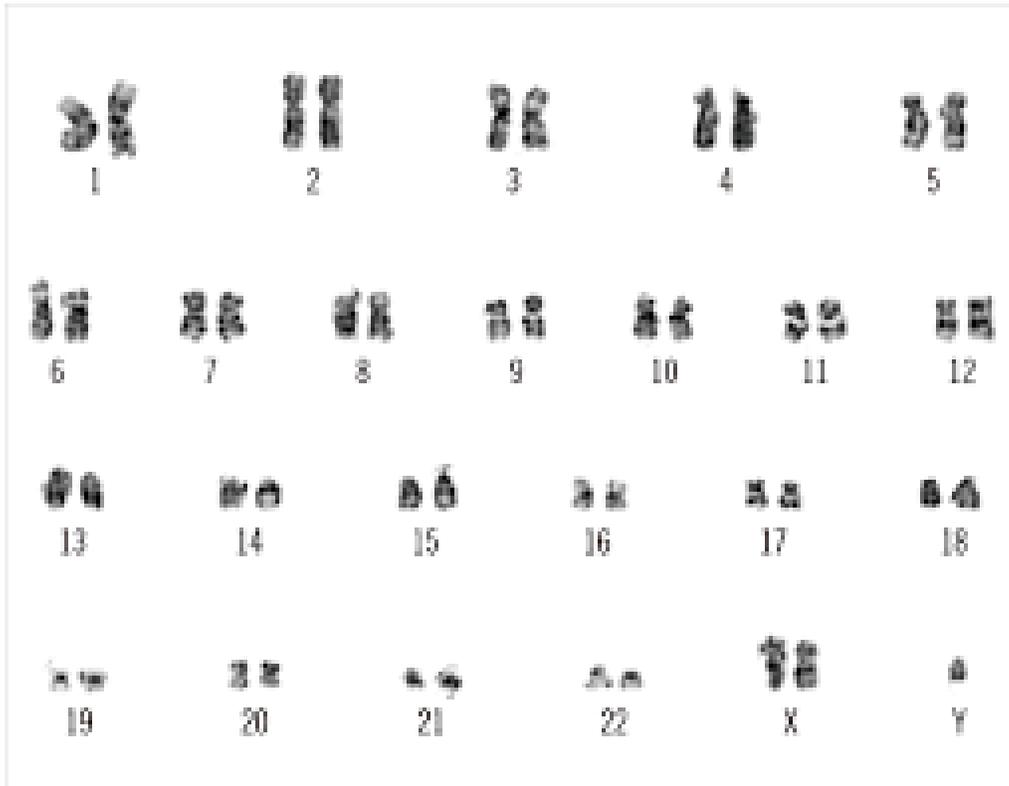




22. If an evil scientist created a cell that would remove other cell's DNA, list 3 structures they could give the cell. Be creative!
23. How do viruses and their lytic and lysogenic cycles affect cells (specifically the nuclear DNA)?
24. Which 2 people created the Punnett square, and why is it so useful?
25. What is helicase and why is it vital to DNA replication?
26. What is the purpose of single-strand binding proteins?
  - A. To catalyze the replication
  - B. To support the fragile replication fork
  - C. To break hydrogen bonds between base pairs
  - D. To prevent rewinding
27. What functional group does the backbone of DNA and RNA contain?
28. List the structures of protein:
  - 1<sup>st</sup>: (Primary)
  - 2<sup>nd</sup>: (Secondary)
  - 3<sup>rd</sup>: (Tertiary)
  - 4<sup>th</sup>: (Quaternary)
29. List a way that proteins can denature, and why?
30. \* List 3 common types of proteins and describe them.
31. \* List 3 proteins and describe them.
32. Let's say I have protein A. Let's say it was misfolded and became a dangerous prion- what harm could this do to the body, and how?
33. \* If 2 lizards had a baby, the mother giving green scales (G) and scaly scales (S) and the father gave brown scales (g) and smooth scales (s), create a Punnett square for all the possible outcomes. Also say whether this is a monohybrid or a dihybrid cross (circle one).



40. Give the gender of the person based off the karyotype. In your response include the name of the disorder this person has and the effects on their body and behavior.



41. Which base pairs are pyrimidines and which base pairs are purines, and what do each of these terms mean (include uracil in your response).

42. Name 4 epigenetic influences and what these do to your genes.

43. Break the levels of organization in chromosomes down... write from the closest to chromosomes to the farthest.

1.

2.

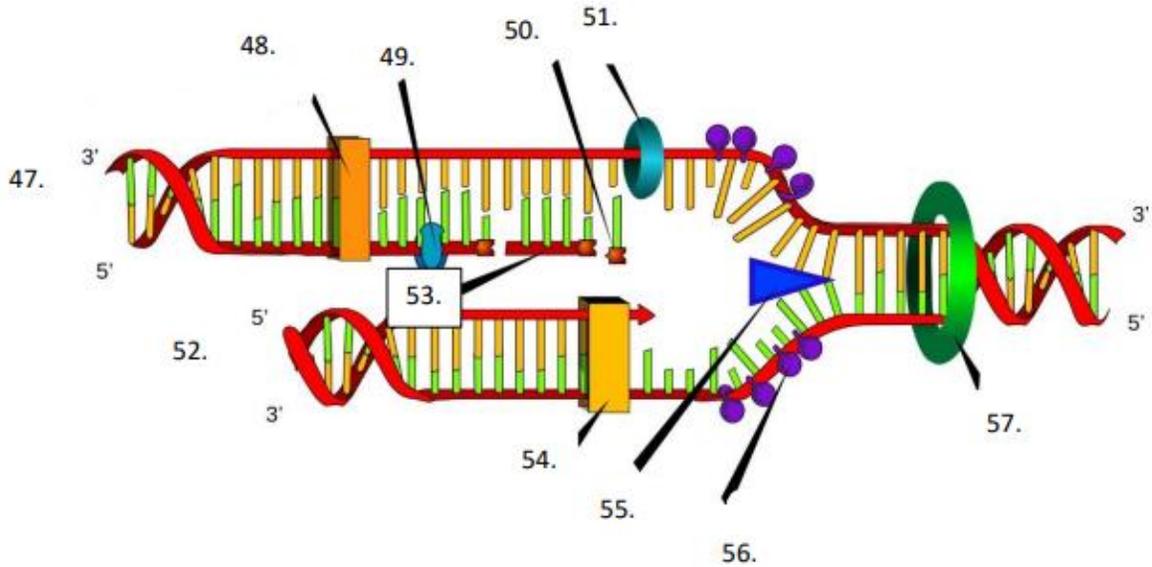
3.

44. Describe cystic fibrosis and some of its symptoms and treatments.

45. Describe Huntington's Disease and some of its symptoms and treatments.

46. Draw a simple chromosome tetrad. This does not need to be detailed.

47.-57. \*\* Label the following, and for a \*\* bonus give all of the functions.



58. Give the translated RNA strand from the following DNA strand:

3-A-T-T-G-C-T-G-A-A-C-T-G-C-T-T-G-A-C-G-T-C-G-G-A-A-A-G-C-T-5

Total Score: \_\_\_/75