RAVEN CHAPTER 15 GUIDED NOTES: GENES AND HOW THEY WORK

1. Briefly describe the function of each type of RNA.
   a. rRNA ____________________________
   b. mRNA ____________________________
   c. tRNA ____________________________

2. Explain the “Central Dogma” of biology.


5. Out of the work of a number of scientists, we have now determined that the four “letters” of the DNA “alphabet” translates to the twenty “letters” of the amino acid “alphabet”. Briefly explain how this works.
6. Briefly describe how the experimental works of Francis Crick and Marshall Nirenberg “cracked the genetic code”.

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7. Why is the genetic code said to be universal? What is the significance of this?

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8. The enzyme which transcribes the DNA is ________________________________

The strand of DNA that is transcribed is called ________________________________

The strand of DNA that is not transcribed is called ________________________________

9. List the highlights of the three stages of transcription.
   
a. Initiation _______________________________________________________________
   ________________________________________________________________

b. Elongation ______________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

   c. Termination ____________________________________________________________
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   ________________________________________________________________
   ________________________________________________________________

10. Describe the significant differences between transcription in prokaryotes and eukaryotes.

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11. Make notes on the following diagram to describe the model of a transcription bubble.

![Diagram of transcription bubble]

12. Describe what happens to the RNA transcript, in eukaryotes, before it leaves the nucleus.

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13. What is the advantage of the 5' cap and poly A tail?

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14. Identify and briefly describe the steps of translation.

a. Initiation _____________________________________________________________

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b. Elongation _____________________________________________________________

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c. Translocation __________________________________________________________

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d. Termination ____________________________________________________________

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15. Identify the roles of the players of the translation process.

a. Transfer RNA ________________________________

b. Aminoacyl-tRNA synthetase ________________________________

c. Ribosomes ________________________________

16. Make notes on the following diagrams to describe the process of translation.

17. Distinguish between exons and introns.

18. Describe the mechanism for splicing RNA.
19. What does alternative RNA processing do for cells?

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20. How does protein synthesis differ between prokaryotes and eukaryotes?

a. ______________________________________

b. ______________________________________

c. ______________________________________

d. ______________________________________

e. ______________________________________

f. ______________________________________

21. Use the diagram to trace the flow of chemical information from a gene to its protein product.