

Neatly
printed
name _____

Signature _____

Please note that there are 105 points on this exam but the maximum score you can receive is 100. The space provided for each question should be sufficient for your answers.

Questions 1-15 are worth 3 points each. Circle your answer.

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

- In human nuclear DNA
 - there are linear chains of nucleotide triphosphates
 - the number of A/T base pairs equals the number of G/C base pairs
 - there are no 3' ends
 - there are no 5' ends
 - none of the above answers are correct
- In general, histone phosphorylation
 - increases the replication rate
 - decreases the replication rate
 - increases the transcription rate
 - decreases the transcription rate
 - none of the above answers are correct
- The Meselson-Stahl experiment showed that
 - DNA replication starts at an origin of replication
 - protein synthesis starts with an amino acid forming a hydrogen bond to a tRNA
 - DNA is the carrier of genetic information
 - DNA replication is semiconservative
 - protein synthesis starts with an amino acid being covalently linked to a tRNA

4. Okazaki fragments
- (a) are found only in bacterial cells
 - (b) are found only in eukaryotic cells
 - (c) involve a RNA primer and a DNA template**
 - (d) involve a DNA primer and a RNA template
 - (e) are used to correct errors after transcription has occurred
5. To begin making RNA, bacteria use
- (a) sigma factors**
 - (b) an origin of replication
 - (c) psychic friends
 - (d) either a or b
 - (e) a DNA primer
- 6. Transcription terminators**
- (a) form a stem-loop structure in the RNA
 - (b) form a stem-loop structure in the DNA
 - (c) terminate transcription in bacteria but not eukaryotes**
 - (d) involve a UAA, UGA, or UAG codon**
 - (e) are only found at the ends of chromosomes
7. Shine-Dalgarno sequences
- (a) can cleave themselves but not ligate themselves
 - (b) can ligate themselves but not cleave themselves
 - (c) can cleave themselves and ligate themselves
 - (d) function as pseudogenes
 - (e) are not found in eukaryotic nuclear RNA**
8. Which of the following does *not* occur before a eucaryotic mRNA is exported from the nucleus?
- (a) The ribosome binds to the 5' cap.**
 - (b) The mRNA is polyadenylated at its 3' end.
 - (c) 7-methyl-G is added in a 5' to 5' linkage to the mRNA.
 - (d) RNA polymerase dissociates.
 - (e) Splicing out of introns in mRNA.
- 9. miRNA's and siRNA's**
- (a) inhibit DNA polymerase
 - (b) inhibit RNA polymerase
 - (c) increase expression of the corresponding mRNA
 - (d) regulate the final step in RNA splicing
 - (e) decrease expression of the corresponding mRNA**
- 10. Eukaryotic genes can have**
- (a) multiple transcription factors bound to the promoter at any given time**
 - (b) only one transcription factor bound to the promoter at any given time
 - (c) transcription factors on the 3' end of the gene at any given time
 - (d) multiple RNA polymerases bound to the promoter at any given time
 - (e) multiple DNA polymerases bound to the promoter at any given time

11. Antibiotics such as erythromycin block

- (a) DNA polymerases
- (b) RNA polymerases
- (c) transcription factors
- (d) tRNA synthases
- (e) ribosomes**

12. Enhancers

- (a)** are only found upstream of genes.
- (b)** can be found upstream or downstream of genes.
- (c) need to be immediately adjacent to the AUG.
- (d) need to be immediately adjacent to the transcription start site.
- (e) need to be immediately adjacent to the kinetochore.

13. Which amino acid would you expect a tRNA with the anticodon 5'-CCA-3' to carry?

- (a) proline
- (b) glycine
- (d) tyrosine
- (d) methionine
- (e) tryptophan**

UAGG

14. Gene transfer by plasmids

- (a) almost always cause cancer
- (b) are often passed to the offspring
- (c) are often found in bacteria**
- (d) are not passed to the offspring
- (e) are often passed to the zygote cells

15. Single nucleotide polymorphisms

- (a)** are often found in humans.
- (b) are rarely found in humans
- (c) are generally found in open reading frames
- (d)** arise from gene duplications
- (e) arise from transposons

3 points

16. In the Hershey-Chase experiment, what was used to label protein, and what was used to label DNA?

DNA P32, protein S35

3 points

17. Starting with a piece of doublestranded DNA, what other enzymes are needed before DNA polymerase can begin replication making a complementary strand?

Hexilase, DNA primase for lagging strand

for both lagging& leading strand,
single stranded DNA-binding protein