**101年**

**王子堅老師部分**

1. Which of the following statement is the most precise modern definition of gene?

(A) A segment of genetic material that determines one phenotype

(B) A segment of genetic material that codes for one enzyme

(C) A segment of genetic material that codes for one polypeptide

**(D) A segment of genetic material that codes for one polypeptide or RNA product**

2. The fundamental repeating unit of organization in a eukaryotic chromosome is:

(A) The centromere

(B) The microsome

**(C) The nucleosome**

(D) Telomere

3. The histone core of a nucleosome is consister of:

(A) One copy each of histones H1, H3 and H4

(B) Two copies each of H1, H3 and H4

(C) One copy each of H2A, H2B, H3 and H4

**(D) Two copies each of H2A, H2B, H3 and H4**

4. The superhelical density of a closed circular DNA, which is 1050 bp and has the linking number of 93, is about?

(A) -0.01

**(B) -0.07**

(C) 0.07

(D) 10.7

**1050/10.5=100 93-100=-7 -7/100=-0.07**

6. E. coli DNA Pol1, but not Pol2, Pol3 can conduct "nick translation" synthesis of DNA. This is because Pol1 possesses?

(A) 3'to 5' exonuclease

**(B) 5'to 3' exonuclease**

(C) Endonuclease

(D) Polymerase activity

7. Which of the following statements is **incorrect**?

(A) RNA may be used as primer for DNA synthesis

(B) DNA chain elongation is 5’ to 3’

**(C) DNA polymerase II is the replicating enzyme used in E. coli 應為pol3**

(D) Primers, DNA template and all 4 dNTPs are required for DNA synthesis

8. From our current understanding of all the known DNA polymerases, the DNA chain elongation at a replication fork cannot be:

(A) Continuous on the leading strand, but discontinuous in the lagging strand

(B) Discontinuous on both strands,

**(C) Continuous on both strands,**

(D) All of above

9. What kind of DNA damage will occur if human cells are treated with type II topoisomerase inhibitor?

(A) Base damage

(B) single-strand breaks

**(C) double-strand breaks**

(D) AP sites

11. E. coil中哪種polymerase的功能可以分解RNA primer

**(A)DNA Pol I** (B)DNA Pol II(C)DNA Pol III (D)RNA Pol

12. Which subunits is required for optical processing in E. coli DNA polymerase III?

(A) Alpha subunit

(B) Gamma subunit

**(C) Beta subunit**

(D) Tau subunit

13. Which protein complex in eukaryotes has the activity similar to DnaB in E-coli?

(A) ORC

**(B) MCM2-7 (DNA helicase)**

(C) SMC protein

(D) Large T antigen

15. Which protein can catalyze the pairing of a single-strand DNA molecule with a complementary region of a duplex DNA molecule?

(A) RuvAB

(B) RecBCD

**(C) RecA**

(D) SSB

16. Transposition can be distinguished from other types of recombination in that the target site in the recipient DNA becomes：

(A) Deleted

**(B) Duplicated and located in each side of the insertion with the same order**

(C) Duplicated and located in each side of the insertion with inverted order

(D) Amplified.

18.TT-dimer 要怎麼修復

**Direct repair: by DNA photlyases**

**柯博元老師部分**

3. RNA polymerase的哪個subunit會辨認promoter

(A) Alpha

(B) Beta

**(C) Sigma**

(D) Gamma

4. Which one is involved in the reaction with ribosome?

**(A) Anticodon arm**

(B) D arm

(C) t-phi-c arm

(d) Amino acid arm

5. Which sequence element promotes the translation initiation at ATG codon in eukaryotes?

(A) operator

**(B) Kozak sequence**

(C) Shine-Dalgarno sequence

(D) UPE sequence

10. Which factor is the specific ***signal molecule*** required for catabolic repression of E-coli lac operon?

(A) cAMP  ***regulatory molecules (100考古)***

(B) Allolactose

(C) beta-galactoside

**(D) Glucose**