主观题　第1题　9分

名词解释

(先将英文名词翻译成中文，再进行解释)

(1) Semi-discontinuous replication

(2) Nonsense mutation

(3) Transposon

主观题　第2题　9分

名词解释

(先将英文名词翻译成中文，再进行解释)

(5) Checkpoints

(6) Direct mutagenesis

(7) Homologous recombination

主观题　第3题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(1) 某种转座子的转座酶在宿主DNA上5 bp间距处错位切割，这会在转座子插入位点周围的宿主DNA产生(　　).

主观题　第4题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(2) In homologous recombination, (　　) helps the invading strand scan for a region of homology in the recipient DNA duplex.

第5题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(3) During the process of DNA replication, the leading strand and all lagging strand fragments are primed by synthesis of a short piece of [填空1] which is then elongated with DNA.

第6题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(4) In base excision repair, the DNA lesion is removed by a specific enzyme [填空1].

第7题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(5) The enzymes needed in the bacterial DNA replication are helicase, topoisomerase, [填空1], DNA polymerase and ligase.

第8题　1分

填空题

(英文题目用英文作答，中文题目用中文作答)

(6) [填空1] 突变是指发生在DNA编码区，并且改变了基因产物的1个氨基酸的点突变。

单选题 第9题 2分

(1) Which of the following prevents positive supercoiling of the DNA strands ahead of the replication bubble?

A Helicase

B Topoisomerase

C Single-stranded binding proteins

D DnaA

单选题 第10题 2分

(2) DNA replication in eukaryotes begins at

A a single origin and proceeds in one direction

B a single origin and proceeds in both directions

C two origins and proceeds in both directions

D many origins and proceeds in both direction

单选题 第11题 2分

(3) DNA polymerases use their _____ activity to remove a mismatched basepair.

A 3' → 5' exonuclease

B 5' → 3' exonuclease

C 5' → 3' polymerase

D RNase

单选题 第12题 2分

(4) Which of the following best describes the function of telomerase at the telomere?

A It makes special primers that do not need to be removed.

B It synthesizes new DNA without the use of a template.

C It adds new DNA to the shorter strand of the telomere overhang.

D It adds new DNA to the longer strand of the telomere overhang.

多选题 第13题 3分

(5) Which of the following statements are wrong?

A Synthesis of the daughter DNA strand from the leading strand template occurs in a 5' to 3' direction.

B Okazaki fragments are involved in the replication of the leading strand in a replication bubble.

C To allow simultaneous replication of the leading and lagging strands by dimeric DNA pol III, the DNA of the lagging strand has to be folded.

D In DNA replication, the daughter strand that is complementary to the DNA fragment 'TAGCAT' is 'ATCGTA'.

单选题 第14题 2分

(6) Which of the following statements is right?

A Eukaryotic replicons can reinitiate a second round in one cell cycle.

B RPA endows the eukaryotic replisome with processivity.

C DNA Pol α removes RNA primers in eukaryotes.

D Telomeres consist of direct repeat sequences.

单选题 第15题 2分

(7) UV light damages DNA molecules most often by...

A deaminating cytosine to uracil

B creating adenine dimmers between adjacent adenines in the DNA chain

C creating thymine dimmers between adjacent thymines in the DNA chain

D depurination or depyrimidination

单选题 第16题 2分

(8) In nucleotide excision repair, what protein cuts the damaged DNA strand in *E. coli*?

A MutH

B MutL

C UvrB

D UvrC

单选题 第17题 2分

(9) A girl was diagnosed with skin cancer. She had always been sensitive to sunlight. This child most likely has a defect in which one of the following processes?

A Nucleotide excision repair

B Base excision repair

C Mismatch repair

D Photoreactivation

单选题 第18题 2分

(10) A 33-year-old man was diagnosed with nonpolyposis carcinoma of colon. His father and paternal uncle also had colon cancers diagnosed by age 40. A likely defect in the patient is…

A Removal of thymine dimers from the DNA

B Loss of DNA ligase activity

C Inability to correct mismatched bases in newly synthesized DNA

D Inability to remove the base U from DNA

多选题 第19题 3分

(11) Which of the following statements are wrong?

A Nucleotide excision repair only repairs pyrimidine dimmers

B In methyl-directed mismatch repair, the strand that is repaired is the non-methylated strand.

C DNA pol III and DNA ligase are required to fill in the repair gap during base excision repair in *E.coli*.

D Recombination repair can solve the bulky lesion in the parental DNA.

单选题 第20题 2分

(12) Which of the following may cause frameshift mutation?

A Deletion

B A→G

C Insert 3 bases

D C→U

单选题 第21题 2分

(13) What kind of mutations do ethidium bromide (溴化乙锭) cause in DNA?

A Transition

B Transversion

C Missense mutation

D Frame-shift mutation

单选题 第22题 2分

(14) Arrange the following in the proper order in which they occur during recombination.
(1) Holliday junction formation
(2) Strand invasion
(3) Branch migration

A 1, 2, 3

B 2, 1, 3

C 1, 3, 2

D 3, 2, 1

单选题 第23题 2分

(15) The ends of a IS element contain…

A genes for the transposase enzyme.

B direct repeats.

C inverted repeats.

D antibiotic-resistance genes.

多选题 第24题 3分

(16) Which of the following statements are wrong?

A Site-specific recombination is also called illegitimate recombination.

B Bacteriophage λ integration is a process of transposition.

C Site-specific recombination requires RecA.

D Transposition requires no homology between sequences nor site-specific.

单选题 第25题 2分

(17) The V, J, and D segments of the heavy chain

A must be a matching set

B are each selected randomly and then combined.

C are present in the constant region.

D are RNA sequences.

多选题 第26题 3分

(18) Which of the following statements are right?

A Phosphorylation of E2F by G1 CDK complexes is the key event for a cell entering S-phase.

B In mismatch repair, MutH endonuclease nicks the daughter strand which has mismatched bases.

C In homologous recombination, RecA promotes the formation of the Holliday junction.

D In eukaryotes, euchromatin DNA replicate late in S-phase.

主观题 第27题 8分

问答题

(1) 比较原核生物与真核生物DNA复制的异同点。

主观题 第28题 8分

问答题

(2) 叙述CDK复合物的组成和作用。

主观题　第29题　12分

问答题

(3) DNA修复方式主要有哪几种类型？分别修复何种DNA损伤？

主观题　第30题　8分

问答题

(4) 论述DNA损伤和DNA突变之间的关系。

主观题　第31题　12分

附加题

（答对加分，总分不超过100分。雨课堂显示得分超过100分的同学按100计分）

假定有两个无细胞转座系统，各自含有Tn3和Ty转座所必需的全部酶类。下列不同的抑制剂对这两个系统会有什么响？为什么？

A. DNA复制抑制
B. 转录抑制剂
C. 反转录抑制剂
D. 翻译抑制剂