

Dr.Ma'moon Ahram's past questions

Chapter 9 (mostly), 12, 13 and 14

Q1) One of the following is NOT true regards to deamination reaction:

- A) Deaminated cytosine is inserted by DNA polymerase
- B) They are considered spontaneous mutations
- C) When deaminated, adenine becomes hypoxanthine
- D) Examples include deamination of methylcytosine in DNA
- E) Mutations persist following DNA replication if not repaired

Answer:

(A)

Explanation: Recall that deaminated cytosine is uracil, which is not present in the DNA. Therefore, it couldn't be possibly inserted by DNA polymerase.

Q2) Strand breaks mainly result from:

- A) Alkylation
- B) Depurination
- C) Replicating repeated sequences
- D) Ionizing radiation
- E) Deamination

Answer:

(D)

Q3) The chemical which causes deamination of cytosine results in its conversion to:

- A) Uracil
- B) Methyl-thymine
- C) Thymine
- D) 5-bromouracil
- E) Methyl-uracil

Answer:

(A)

Q4) One of the following is NOT true regarding to any particular operon:

- A) It exists in bacteria but not in human cells
- B) It is regulated by multiple promoters
- C) It contains several shine-dalgarno sequences
- D) It contains only one transcription start site
- E) It produces proteins of different functional activities

Answer:

(B)

Q5) DNA glycosylases cleaves the..... and Uvr complex cuts.....:

- A) phosphodiester, phosphodiester
- B) phosphodiester, hydrogen bonds
- C) glycosidic, phosphodiester
- D) glycosidic, glycosidic

Answer:

(C)

Q6) Nucleotide Excision Repair in bacteria the enzyme that is recruited to the lesion and create cuts is:

- A) DNA polymerase 1
- B) UvrABC protein complex
- C) Transcription factor 2 H(TFIIH)
- D) RPA

Answer:

(B)

Q7) Pyrimidine dimers are reversed by enzymes known as:

- A) Ligase
- B) DNA polymerase 1
- C) Photolyases
- D.) None of the above

Answer:

(C)

Q8) Photolyases are known to:

- A) Correct base mismatches in DNA
- B) Join DNA ends
- C) Exist in human cells
- D) Remove pyrimidine dimers
- E) Remove intercalating agents

Answer:

(D)

Q9) The wrong statement about Deamination is:

- A) The deamination of cytosine yields uracil
- B) The deamination of adenine yields hypoxanthine
- C) The deamination of thymine yields methylated cytosine
- D) it is an induced mutation
- E) C+D

Answer:

(C)

Q10) When there is a base mispairing in bacterial DNA, this is how bacteria can distinguish the wrong base:

- A) They activate special DNA polymerase.
- B) They recognize the replicating DNA.
- C) They recognize the damaged base.
- D) They change either base randomly.
- E) They recognize which DNA is unmethylated.

Answer:

(E)

Remember: the methylated regions in the template strand are the GATC regions.

Q11) DNA glycosylases have the following effect on DNA:

- A) They remove pyrimidine dimers
- B) They form phosphodiester bonds
- C) They create AP sites
- D) They add bases to DNA
- E) They join broken DNA strands

Answer:

(C)

Q12) Nucleotide excision repair in bacteria does NOT require the following molecular components:

- A) A primase
- B) An endonuclease
- C) A DNA ligase
- D) A helicase
- E) A DNA polymerase

Answer:

(A)

Q13) Which of the following occurs in eukaryotes but not prokaryotes?

- A) miRNA regulation
- B) Synthesis and translation of an mRNA strand at the same time
- C) Removal of sigma subunit
- D) Identification of the shineDalgarno sequence

Answer:

(A)

Q14) Which of the following sentences does best describe the core promoter?

- A) Region of an mRNA between the 5'-end and the translation start site
- B) A cluster of prokaryotic genes that are transcribed together
- C) Region of DNA in front (downstream) of a structural gene mainly composed of proximal elements
- D) Region of DNA usually in front (upstream) of a gene that binds RNA polymerase and initiates gene expression
- E) Consensus sequences that bind activator proteins and enhance the Transcription

Answer:

(D)

Q15) Which of the following types of DNA polymerase has 3'→5' exonuclease activity?

- A) DNA polymerase I
- B) DNA polymerase II
- C) DNA polymerase III
- D) DNA polymerase IV

Answer:

(C)

Q16) Which of the following is NOT correct about transcription?

- A) In eukaryotes, the mRNA carries only one gene (Monocistronic)

B) In prokaryotes, several genes may be carried on the same mRNA (Polycistronic)

C) The consequences of an error in the RNA synthesis is less significant than that in the DNA replication

D) In prokaryotes, the termination signal usually consists of a GC-rich sequence followed by T residues.

E) In eukaryotes, the termination signal determined by a consensus sequence followed by a downstream GU-rich sequence.

Answer:

(D)

Q17) Pick the correct pair with respect to primers used in DNA replication:

A) RNA primer- for prokaryotes only

B) DNA primer-for eukaryotes only

C) DNA primer- for both prokaryotes and eukaryotes

D) RNA primer- for both prokaryotes and eukaryotes

Answer:

(C)

Q18) An RNA produced from a fragment of DNA has the sequence of AAUUGGCU. The sequence of the non-template strand in the DNA that gave rise to this sequence is which one of the following?

A) AGCCAATT

- B) AAUUGGCU
- C) AATTGGCT
- D) TTAACCGA
- E) UUAACCGA

Answer:

(C)

Q19) The following mutation would cause constitutive expression of the Lac operon:

- A) Constant binding of the RNA polymerase to the promoter
- B) Deletion of the promoter
- C) Deletion of the Lac I gene
- D) Inability of allolactose to bind to the lac repressor

Answer:

(C)

Q20) in eukaryotes, the pre-mRNA is:

- A) The mRNA that is non-coding
- B) The mRNA that is ready for transcription
- C) The mRNA that is not poly-adenylated
- D) The mRNA that is not capped
- E) The mRNA that is not spliced

Answer:

(E)

Q21) Bacterial gene (gene A) ordinarily makes a protein that binds to DNA. A mutation of gene A decreases the expression of another gene, gene B. We can conclude that:

- A) Gene A is a positive regulator of gene B
- B) Gene A is a negative regulator of gene B
- C) Gene B is a positive regulator of gene A
- D) Gene B is a negative regulator of gene A
- E) Genes A and B regulate one another

Answer:

(A)

Q22) Which of the following steps is NOT correct about producing mature RNA (mRNA)?

- A) A poly-A tail is added to the 3'-end of the RNA
- B) Exons are joined together
- C) Binding of miRNA to the 3'-untranslated region of mRNA
- D) Introns are removed from RNA

E) Adding a cap to the 5'-untranslated region (5'-UTR) of the RNA

Answer:

(C)

Q23) During transcription and elongation of RNA in prokaryotic cells, the two strands are separated from each other by:

- A) DNA gyrase
- B) The RNA polymerase itself
- C) Helicase
- D) The AT-rich regions of genes
- E) The sigma subunit

Answer:

(B)

Q24) The consensus sequence for the termination of transcription in prokaryotic cells functions in this manner:

- A) It destabilizes the interaction of the RNA polymerase to the DNA

- B) It causes the RNA polymerase to stop until it dissociate spontaneously
- C) It attracts transcription termination proteins to the site
- D) It forces the RNA polymerase to move in the opposite direction
- E) It encodes an endonuclease-specific sequence

Answer:

(A)

Q25) In eukaryotes, which of the following molecules can tell you the sequence of introns and exons?

- A) Polypeptide
- B) Complementary DNA (cDNA)
- C) miRNA
- D) mRNA
- E) Pre-mRNA

Answer:

(E)

Q26) In bacteria, which of the following RNA polymerase enzyme subunits is responsible for promoter recognition?

- A) The beta (β) subunit
- B) The epsilon (ϵ) subunit
- C) The delta (δ) subunit
- D) The sigma (σ) subunit
- E) The gamma (γ) subunit

Answer:

(D)

Q27) Which of the following is not a function of the 5' cap?

- A) Adenylates the 3' end
- B) Regulates nuclear export
- C) Increases half-life of mRNA
- D) Plays a role in translation

Answer:

(A)

Q28) As more and more lactose is metabolized what is expected to happen?

- A) Decrease in transcription of the lac operon because of the increase of glucose.

B) Increase in transcription because of the increase of lactose.

C) Decrease in transcription because of the decrease of Allolactose.

D) NONE of the above

Answer:

(A)

