1- **An apyrimidinic or apurinic (AP) site forms in which type of DNA repair ?**
a . Photoreactivation
b . Mismatch repair
c . Base excision repair
d . Direct repair
e . Nucleotide excision repair

2- **Base analogs are mutagenes because of which characteristic ?**
a . They are similar in structure to the normal bases
b-They produce changes in DNA polymerase that cause it to malfunction
c-They distort the structure of DNA
d-They chemically modify the normal bases

3-**In mammals , double - strand breaks in DNA are primarily repaired through**
a . Direct repair
b . Mismatch repair
c . Non homologous end joining
d . Nucleotide excision repair

4-**The strand that has the same sequence as the mRNA is called the antisense strand**
a-True
b-False

5-**Which of the following repairing pathways is / are dysfunctional in patients with hereditary nonpolyposis colon cancer**
a . Mismatch repair
b . Nucleotide excision repair
c . Direct repair
d . Base excision repair

6-**Sigma factors**
a-Help ribosome polymerase in recognizing mRNA during the initiation of translation .
b- Help prokaryotic RNA polymerase in recognizing the origin of replication
c- Help eukaryotic RNA polymerase in recognizing the promoter region d-Decreases the nonspecific binding affinity of the core enzyme
e-None of the above

7-**The most frequent site of alkylation is the keto - group of carbon atom of the guanine residue**
a . C - 6
b . C - 1
c. C - 2
d . C - 4

8-**According to the central dogma , which of the following represents the flow of genetic information in cells**

a . RNA to DNA to protein

b . protein to DNA to RNA

c . DNA to protein to RNA

d . DNA to RNA to protein

9-**Homologous recombination takes place in the G1 phase the cell cycle**

a-true

b-false

10-**Which of the following is / are not cis - acting elements**

a . TATA box .

b . Transcription factors

c . Long - range regulatory elements : enhancers and silencers

d . CAAT and GGGCGG boxes

e . Activators , repressors

f . B and E

11-**How many types of excision repair systems are known ?**

a . 3

b . 4

c . 1

d . 2

12-**what type of DNA lesion is caused by UV - light ?**

a . Pyrimidine dimers

b . Deaminated cytosines

c . Depurinations

d . Mismatch bases

e . Large deletions

13-**The protein is produced by a regulatory gene ?**

a . Inducer

b . Corepressor

c . Repressor

d . Operon

e . Promoter

14-**Double - stranded DNA breaks can be generated by**

a . Gamma radiation

b . X - rays

c . Radioactive materials.

d . UV - radiation

e . All of the above except D

f . B and D

15-**What is adenine glycosylase ?**
a . A base excision repair enzyme
b . A deaminating agent
c . A base ligase
d . A base analogue

16-**A mutation in the regulatory gene could influence the binding of RNA polymerase to the DNA**
a . Repressor
b. Operon.
c. Corepressor
d. Promoter
e . Inducer

17-**How does the mismatch repair system in bacteria can distinguish between the old and the newly mutated synthesized strand ?**
a . All CG base pairs in the newly synthesized strand are methylated
b . RNA primase remains bound to the RNA primer of Okazaki fragments
c . adenine in the parental strand is methylated in the sequence 5'GATC
d . cytosine in the parental strand is methylated in the sequence 5'CG

18-**The order of the structural genes in the trp operon is**
a . trpE , trpc , trpD , trpB , trpA
b . trpE , trpB , trpc , trpD , trpA
c . trpa , trpB , trpc , trpD , trpE
d . trpE , trpD , trpc , trpB , trpA

19-**Which base is frequently present in place of cytosine that accounts for spontaneous mutations in our DNA ?**
a . 5 - methylcytosine
b . Hypoxanthine
c . Adenine
d . Xanthine

20-**Which inherited human disorder results from mutations in the nucleotide excision repair system ?**
a . Cockayne syndrome
b . Werner syndrome
c . Fanconi anemia
d . A and B

21-**Alkylating agents , deaminating chemicals , Intercalating agents and hydroxylamine , all of them lead to mutations by modifying the chemical structure of bases**
a-True
b-False

22-**Base analogs are mutagenes because of which characteristic ?**

a . They are similar in structure to the normal bases .

b . They distort the structure of DNA .

c . They chemically modify the normal bases .

d . They produce changes in DNA polymerase that cause it to malfunction .

23-**Which of the following pathways is / are responsible for repairing pyrimidine dimers ?**

a . Direct repair

b . Mismatch repair

c . Non - homologous end joining

d . Nucleotide excision repair

e . A and B

f . A and D

24-**In eukaryotic cells , transcription cannot be started until**

a . The two DNA strands have completely separated and exposed the promoter .

b . Sigma factors have bound to the promoter

c . The chromatin is modified and remodeled to the open configuration .

d . Several transcription factors bound to the promoter .

e . A and C

f . Cand D

25-**The gene product of lacA gene in lac operon is ?**

a . B - galactoside permease

b. B - galactoside transacetylase

c . B - galactosidase

d . B - galactoside isomerase

26-**Rho factors are responsible for the termination of transcription in eukaryotes**

a-True

b-False

27-**During which stage of bacterial transcription is the o subunit of the RNA polymerase involved ?**

a . Splicing

b . Initiation

c. Termination

d . Elongation

28-**Which of the following is / are not cis acting elements**

a . TATA box .

b . Transcription factors

c . Long - range regulatory elements : enhancers and silencers

d . CAAT and GGGCGG boxes

e . Activators , repressors

f. B and E

29-**What alkylating agents do ?**
a . They cause pyrimidine dimers .
b . They add methyl or ethyl groups to bases .
c . They oxidize guanine .
d . They deaminate cytosine .
e . They can do all of the above .

30-**Which of the following are examples of alkylating agents** .
a . hydroxylamine (NH2OH)
b . Ethylmethane sulfonate
c . Nitrosamines
d . Nitrous acid (HNO2)
e . A and B
f . B and C

31-**The induce expression of the genes of the lactose operon by termination production of repressor molecules**
True
False

32-**RNA polymerase**
a Synthesizes RNA in a 5 ' to 3 direction using dNTPs as precursors
b . Can initiate RNA synthesis without a primer
c Can also replicate DNA
d . Separates DNA strands up to thousands of base pairs , then copies one of them .
e . Is activated by antibiotics rifampicine
f. A and B

33-**The cell produces a mutant trp repressor that binds to its operator site even if no tryptophan is present . The enzyme genes will never be expressed**
True
False

34-**The strand that has the same sequence as the mRNA is called the antisense strand**
True
False

35-**The highest level of transcription of the lac operon occurs when**
a . Glucose present , lactose absent
b . Glucose present , lactose present
c . Glucose absent , lactose absent
d . Glucose absent , lactose present
e . B and D

36-**Eukaryotic cells can control gene expression by**

a . Histone acetylation of nucleosomes .

b . Induction of operators in the promoter .

c . Repression of operons .

d . DNA acetylation .

37-**The cell produces a mutant trp repressor that cannot bind to the operator . The enzyme genes will be constitutively expressed**

True

False

38-**Which base is generated as aresult of deamination of adenine ?**

a . Xanthine

b . Cytosine

c . Uracil

d . Hypoxanthine

39-**In case of thymine dimer which type of ring compound is formed ?**

a . Cycloheptane

b . Cyclohexane

c . Cyclobutane

d . Cyclopropane

40-**Transcription of the structural genes in the lac operon starts when glucose is present**

True

False

41-**In eukaryotes , there are several different types of RNA polymerase . Which type is involved in transcription of mRNA for a CFTR protein** ?

a . RNA polymerase I

b . RNA polymerase II

c . ligase

d . RNA polymerase Ill

e . primase

42-**In the absence of allolactose , the lac repressor**

a . Binds to the promoter

b . Binds to the operator

c . Binds to the regulator gene

d . Cannot bind to the operator

43-**Nucleotide sequence in DNA to which RNA polymerase binds to begin transcription is called .**
a . Start codon
b . Promoter
c . Primer
d . Origin

44-**Which of the following repair pathways are capable of O6- methylguanine ?**
a . Mismatch repair
b . Base excision repair
c . Direct reversal by a specific DNA methyltransferase
d . Nucleotide excision repair
e . Direct reversal by photolyase

45-**Cytosines are often deaminated to give thymines**
True
False

46-**In Eukaryotes , the core promotor is composed of Goldberg - Hogness box and transcriptional start site**
True
False

47-**Transcription is terminated at stop codons in the mRNA**
True
False

48-**What is the main enzyme that repairs thymine dimer ?**
a . DNA ligase
b . DNA protolyase
c . DNA glycosylase
d . DNA photolyase
e . DNA gyrase

49-**Which of the following DNA repair pathway (s) are able to repair DNA molecules containing deaminated cytosines or Uracil ?**
a . Nucleotide excision repair
b . Mismatch repair
c . Base excision repair
d . Direct repair

50-**Which of the following genes is not a structural of the lac operon**
a . lacZ
b . lacI
c . lacA
d . lacY

51- **In the trp operon, what happens to the trp repressor in the absence of tryptophan?**
a. It binds to the operator and represses transcription.
b. It cannot bind to the operator and transcription takes place.
c. It binds to the regulator gene and represses transcription.
d. It cannot bind to the regulator gene and transcription takes place.

52- **What are polyribosomes?**
a. ribosomes containing more than two subunits.
b. ribosomes associated with more than one tRNA.
c. multiple copies of ribosomes reading a single MRNA simultaneously.
d. aggregations of vesicles containing ribosomal RNA.

53- _____ **helps form the structure of the ribosome**
a. mRNA
b. rrRNA
c. rRNA
d. tRNA
e. sRNA

54- **In bacteria, the initiator tRNA is designated tRNA met and it carries a methionine rather than a formylmethionine.**
Select one:
True
False

55- **When does translation begin in prokaryotic cells?**
a. once the pre mRNA has been converted to mRNA.
b. as soon as transcription has begun.
c. after the 5' caps are converted to mRNA.
d. as soon as the DNA introns are removed from the template.
e. after a transcription initiation complex has been formed.

56- **Which of the following serves to identify the eukaryotic translation start site?**
a. Poly(A) tail.
b. 5' cap consisting of 7-methylguanosine.
c. Intron excision.
d. The start codon.
e. None of the above.

57- **There is a report in the journal nature indicated that there are around 25,000 genes in humans. However, it is likely that there are more than 100,000 different proteins made in humans. A possible explanation for this is:**
a. Alternative splicing of mRNA.
b. Acetylating of histones to make DNA more accessible for transcription.
C. Regulation of export of mRNA from the cytoplasm to the nucleus.
d. Regulation of gene expression by steroid hormones.

58- **As a result of alternative splicing, multiple protein product can be produced from a single gene, these different proteins are called**
a. Uniforms.
b. Isoforms.
E. Paralogs.
d. Homologs.

59- **In the presence of allolactose, the lac repressor**
A. Binds to the promoter
b. Binds to the laperator
c. Binds to the regulator gene
d. Cannot bind to the operator

60- **Which of the following is (are) true of snRNPs?**
a. There are five snRNPs involved in splicing are U1, U2, U5, U4, and U7.
b. They are made up of both RNA and proteins.
C. They bind to splice sites at exon intron junction and intron branch point.
d. They join together to form a large structure called the spliceosome.
e. They act only in the Cytosol.
f. A and E
g. B, C and D

61- **The core promoter by itself produces a high level of transcription. This is termed basal transcription.**
Select one:
True
False

62- **The lactose operon is likely to be transcribed when the cyclic AMP and lactose levels are both high within the cell Select one:**
True
False

63- **Transcription of the structural genes in the lac operon starts when the pathway's substrate is present Select one:**
True
False

64- **A particular triplet of bases in the template strand of DNA is 5'-TGA-3'. The corresponding codon for the mRNA transcribed is**

a. 5'-ACT-3'

b. 3'-ACT-5'

C.5' -ACU-3'

d. 3'-ACU-5'

65- **A ribosome consists of how many subunits?**

a. 1 subunit

b. 4; heterodimer

c. 2; one large and one small subunit

d. 3, 2 small subunits, 1 large subunit

e. 2, both large subunits

66- **Ribosomes contain three discrete sites**

a. Peptidyl site (P site), Aminoacyl site (A site) and External site (E site)

b. Peptidyl site (P site), Aminoacyl site (A site) and Exit site (E site)

C. Peptidyl site (P site), Amino acid site (A site) and Exit site (E site)

d. Phosphodiester site (P site), Aminoacyl site (A site) and Exit site (E site)

67-**prokaryotic genes, a promoter consensus sequence located about 10 bases upstream from the start of transcription is**

a. Meselson-Stahl box.

b. Goldberg Hogness box

c. Pribnow box.

d. Shine-Dalgarno box.

e. CAAT box.

68-**How does termination of translation take place?**

a. The end of the mRNA molecule is reached.

#**b. A stop codon is reached**

c. The poly A tail is reached

d. The 5' cap is reached

69- **Nonsense mediated mRNA decay is proceeded due to the**

a. Absence of MRNA tailing.

b. Absence of MRNA capping.

c. Presence of premature termination codon.

d. Presence of mRNA tailing and capping.

e. A and B

f. None of the above

70- **At the termination step of translation, the Stop codons recognized by**
a. Anticodons
b. translation factors
c. TRNA units
d. transcription factors
e. release factors

71- **Post transcriptional processing involves several events.**
a. 5 Capping
b. 5 end Methylation
c. 3 Polyadenylation
d. Splicing (removing introns)
e. All of the above
f. All except B

72- **Process of cutting introns out of immature RNAS and stitching together the exons to form final product is called**
a. DNA splicing
b. Alternative splicing
C. RNA transcription
d. RNA translation
e. RNA splicing

73- **Which enzyme causes a covalent bond to attach lysine to the polypeptide?**
a. ATPase
b. lysine synthetase
#**c. peptidyl transferase**
d. RNA polymerase
e. Ligase

74- **Transfer RNA binds to the mRNA codon with a ——**
a. Anticodon
b. AUG
c. Complimentary codon
d. Hydrogen bond
e. specific amino acid

75- **Which of the following statements about RNA splicing is FALSE?**
a. It removes the introns
b. It is performed by the spliceosome
c. It shortens the RNA molecule
d. It always occurs in the nucleus
e. All of the above statements are true

76- **The branch point site (A) residue that involves in lariat formation is lactated in**
a. Exon
#b. Intron
c.5UTR
d. 3'UTR
e. A and B

77- **A mutation in the TATA box will prevent the initiation of transcription and causes transcription to begin at an incorrect location Select one:**
True
False

78- **RNA polymerase moves in which direction along the DNA?**
a. 5' to 3' along the template strand
B.3' to 5' along the template strand
C.3' to 5' along the sense strand
d.5' to 3' along the double stranded DNA
e. 3' to 5' along the coding strand

79- **What is correct regarding enhancers**
a. Are trans-acting elements
b. Unlike promotor, they are located closer or 1000s nucleotide from the target genes, either upstream or downstream or with transcribed regions.
C. Bind with activator proteins to reduce transcription of the target gene
d. Located only between the gene and the promoter
e. B and C
f. All of the except D

80- **How does Nucleotide excision repair (NER) differ trom base excision repair (BER) Select one:**
a. NER recognizes and removes a large patch around the damage, rather than just a single base as in BER
b. NER recognizes and reverse a large patch around the damage, rather than just a single base as in BER
c. BER recognizes and reverse a large patch around the damage, rather than just a single base as in NER
d. BER recognizes and removes a large patch around the damage, rather than just a single base as in NER