

GOVERNMENT ZIRTIRI RESIDENTIAL SCIENCE COLLEGE

Subject: ZOOLOGY

Paper name: Molecular Biology and Genetics

Paper No: ZL XVII:

Semester: VI

UNIT 1

1. 'Housekeeping genes' are
 - a) Genes that are switched on when conditions are favourable
 - b) Genes that are expressed only at minimal levels
 - c) Genes that are expressed steadily despite varying conditions
 - d) Genes that are switched on in the presence of a specific nutrient.
2. Which of the following does not contain DNA?
 - a) Chromatin
 - b) Histones
 - c) Nucleosome
 - d) Both histones and nucleosome
3. In which of the following would mRNA synthesis be the highest?
 - a) facultative heterochromatin
 - b) constitutive heterochromatin
 - c) euchromatin
 - d) Same in all of the above
4. The two strands of a double-stranded DNA molecule are connected by:
 - a) Hydrogen Bond
 - b) phosphodiester bonds
 - c) Both A&B
 - d) Not A&B
5. All of the following are core histones, except:
 - a) H1
 - b) H2A
 - c) H3
 - d) H4
6. The complementary sequence of 5'-AGGGTCTCGA- 3' is:
 - a) 5'- AGCTCTCCCA - 3'
 - b) 5'- TCCCAGAGCT – 3'
 - c) 5'-TCGAGACCCT - 3
 - d) 5'- ACCCTCTCGA - 3'
7. The average size of DNA in a nucleosome unit is
 - a) ~146 nucleotides
 - b) ~146 kilo-bases
 - c) ~136 mega-bases
 - d) ~146 Giga Bases

UNIT 2

1. During DNA replication DNA polymerase synthesizes DNA from

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- a) 5' to 3' direction
 - b) 3'to 5' direction
 - c) Both direction
 - d) By Okazaki fragments
2. The model of DNA replication is semi conservative because
- a) Because it is synthesized continuously
 - b) Because it contains Okzaki fragments
 - c) Newly synthesized strand contain old and new DNA strand in the first round of replication
 - d) Newly synthesized strand contain old and new DNA strand in the 2nd round of replication
3. DNA Helicase enzyme relieves stress by
- a) +ve Supercoil
 - b) No supercoil
 - c) -ve supercoil
 - d) both +ve and -Ve supercoil
4. The enzyme which is responsible for repairing Nucleotide Excision Repair is
- a) DNA Glycosylase
 - b) UVR proteins
 - c) ku proteins
 - d) mut proteins
5. The enzyme which is responsible for repairing Double strand break is
- a) DNA Glycosylase
 - b) UVR proteins
 - c) ku proteins
 - d) mut proteins
6. The enzyme which is responsible for repairing Missmatch repair is
- a) DNA Glycosylase
 - b) UVR proteins
 - c) ku proteins
 - d) mut proteins
7. The enzyme which is responsible for repairing Base excision is
- a) DNA Glycosylase
 - b) UVR proteins
 - c) ku proteins
 - d) mut proteins

UNIT 3

1. Which of the following is not true for the “central dogma of molecular biology”?
 - a) DNA is transcribed into RNA
 - b) RNA can be reverse transcribed into DNA
 - c) RNA is translated into proteins
 - d) Proteins can be reverse translated into RNA or DNA
2. Which of the following is not a characteristic feature of prokaryotic transcription?

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- a) dsDNA is converted into ssRNA molecule
 - b) the synthesized mRNA is transported out from the nucleus by proteins
 - c) transcription occurs almost simultaneously with translation
 - d) strand synthesis occurs from 5' to 3' direction
3. Which of the following is not a stop codon in transcription?
- a) UAU
 - b) UAA
 - c) UAG
 - d) UGA
4. Which subunit of RNA-polymerase is responsible for directing its binding to -35 and -10 regions for transcription initiation?
- a) Alpha-subunit
 - b) Beta-subunit
 - c) Rho-subunit
 - d) Sigma-subunit
5. Of the 64 possible mRNA codons in the genetic code, the only two Amino acids that have only one type of corresponding codon are
- a) Methionine and Phenylalanine
 - b) Phenylalanine and Tryptophan
 - c) Tryptophan and Methionine
 - d) Methionine and Threonine
6. The first subunit of ribosome that binds to the mRNA for translation initiation process is
- a) 20S
 - b) 30S
 - c) 40S
 - d) 50S
7. tRNA acceptor arm has unique sequence 5' to 3'
- a) 5'- CCA 3'
 - b) 5'- CAC – 3
 - c) 5'-ACC – 3
 - d) 5''-
 - e) AAC - 3'

UNIT 4

1. In bacteria, when both Glucose and lactose are present, then..... (A) Since lactose can induce the lac operon easily, the lac operon is immediately switched on via CAP and lactose is also used as energy source. (B) Glucose is preferentially used as energy source, CAP is not activated and lac operon is switched off
 - a) Only A is true
 - b) Only B is true
 - c) Both A and B are true
 - d) Both A and B are false
2. Pick the odd one out

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- a) Pea shape (round or wrinkled)
 - b) Pod color (green or yellow)
 - c) Flower color (purple or white)
 - d) Flower color (Red and white)
3. ABO blood group is an example of
- a) Co Dominance
 - b) multiple alleles
 - c) dominance
 - d) All the above
4. Two allelic genes are located on
- a) Same chromosome
 - b) non homologous chromosome
 - c) homologous chromosomes
 - d) None of the above
5. We inherit our mitochondria from our
- a) Mother
 - b) Father
 - c) Both
 - d) None of the above

UNIT 5

1. A father has haemophilia and is showing severe symptoms. His wife is normal, and is not a carrier for the condition. In such a case, what would be the inheritance pattern in their children?
 - a) All his sons will have haemophilia
 - b) All his daughters will have haemophilia
 - c) All his sons will be carriers
 - d) All his daughters will be carriers.
2. An organism's genotype is the set of genes in its DNA responsible for a particular trait is
 - a) Phentype
 - b) Genotype
 - c) Genotype and Phenotype
 - d) Phenocopy
3. The chance of two gene linkage increase when the distance
 - a) Increase
 - b) Decrease
 - c) Unaffected
 - d) No relation
4. Substitution of base that leads to stop codon leads to..... mutation
 - a) Silent

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- b) Missense
 - c) Non sense
 - d) Null
5. Frameshift mutation is due to
- a) Deletion
 - b) Insertion
 - c) base substitution
 - d) All of the above

Fill in the blanks

UNIT 1

1. Nucleotides on a single-stranded DNA molecule are connected by _____ bonds
2. In B-Form of DNA the number of bases per turn is _____ bases
3. In DNA the five-carbon sugar molecule with a nitrogenous base—which two together are called _____
4. Giant chromosomes- Lampbrush and Polytene chromosomes are active site of _____ Synthesis

UNIT 2

1. During DNA replication the strand of DNA which is synthesized continuously is called _____
2. The enzyme which is responsible for repairing Double strand break is _____
3. In prokaryotes the main enzyme which catalyse the synthesis of DNA during DNA replication is _____

UNIT 3

1. The promoter sequence in prokaryotic transcriptions is known as _____
2. In *lac operon* the gene *lac-z* codes for the enzyme
3. The three stop codons are _____, _____ & _____.

UNIT 4

1. What is the percentage of dominant trait in Mendel's F₂ generation
2. In genetics the expression of one gene is affected by the expression of one or more independently inherited genes. This phenomena is called _____
3. Three or more alternative forms of a gene (alleles) that can occupy the same locus is called _____

UNIT 5

1. The genetic disease that resulted from extra X chromosome is termed as _____ syndrome
2. The genetic disease that resulted from absence of one X chromosome is termed as _____ syndrome

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3. The absence of blood clotting factor can cause _____

Answer Key

MCQ

UNIT .1

c,b,c,a,a,b,a

UNIT2

a,c,c,b,c,d,a

UNIT 3

d,b,a,d,b,b,a

Unit 4

b,d,d,c,a

Unit 5

a,b,b,c,d

Fill in the blanks

UNIT 1

1. phosphodiester
2. 10
3. Nucleoside
4. RNA

UNIT 2

1. Leading strand
2. ku proteins
3. DNA polymerase III

UNIT 3

1. TATA Box
2. Beta galactosidase
3. UAG, UAA, and UGA

UNIT 4

1. 75
2. Pleiotropy
3. Multiple alleles

UNIT 5

1. Klinefelter

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2. Turner
3. Haemophilia