

TYBSc Semester 6

Paper-3

Which of the following types of mutations involves loss or gain of whole set of chromosomes, giving rise to aneuploidy or polyploidy?

- a) Genomic mutation
- b) Point mutation
- c) Gene mutation
- d) Chromosomal aberration

Which of the following types of substitution mutation involves base change in DNA without affecting the open reading of the protein (i.e no change in the function or structure of the protein)?

- a) Nonsense mutation
- b) Silent mutation
- c) Frame-shift mutation
- d) Miss sense mutation

What is the location of the FMR1 gene on the X chromosome?

- a) Xp28.3
- b) Xq27.3
- c) Xqtel
- d) Xptel

Which type of mutation is most often caused in the DNA due to UV light?

- a) Base pair substitutions
- b) Single-strand breaks
- c) Double-strand breaks
- d) Thymine dimer

Which of the following enzyme is involved in DNA damage repair by removal of methyl group onto itself and gets inactivated?

- a) DNA methylase
- b) Methyltransferase
- c) Isomerase
- d) Methylreductase

How many amino acids comprise the Helix-Turn-Helix motif?

- a) 40
- b) 10
- c) 20
- d) 30

What is a tautomer?

- a) The nitrogen bases in DNA can appear in more than one isoforms.
- b) The pentose sugar in DNA can appear in more than one isoforms.
- c) The damage to the DNA due to the break of the glycosidic bond between the purine base and deoxyribose.
- d) The damage to nitrogen bases of the DNA due to loss of their amino group.

Which of the following technique is used for DNA sequencing?

- a) Miller- Urey method
- b) Maxam-Gilbert method
- c) Southern Blotting method
- d) Western Blotting method

Which of the following enzyme is useful to make homopolymer cohesive tails at 3' end of DNA fragments?

- a) Terminaltransferase
- b) Polynucleotidekinase
- c) T4 DNA ligase
- d) Alkaline phosphatase

Which of the following is the source for Bam HI?

- a) *Bacillus amyloliquifaciens*
- b) *Bacillus albus*
- c) *Haemophilus aegyptius*
- d) *Bravibacterium albidum*

Which of the following is used as a support for immobilization of molecule of interest in blotting technique?

- a) Whatman Filter paper 42
- b) Whatman Filter paper 40
- c) X ray film
- d) Nitrocellulose membrane

Which of the following is an example of cloning vector?

- a) ORI
- b) Sall
- c) pBR 322
- d) E. coli

Which of the following is the useful technique for gene amplification?

- a) EcoR
- b) Western Blotting
- c) Homo-polymer tailing
- d) PCR

Which of the following is metacentric chromosome in human ?

- a) Chromosome 20
- b) Chromosome 21
- c) Chromosome 22
- d) Y Chromosome

Which of the following is an example of Translocation ?

- a) Cat cry syndrome
- b) Robertsonian Syndrome
- c) Turner Syndrome
- d) Patau's Syndrome

Which of the following disorder shows reduction or absence of melanin causing white skin, light hair and vision problem?

- a) G6PD Deficiency
- b) Alkaptonuria
- c) Albinism
- d) PKU

Which of the following is inherited as X-linked recessive trait?

- a) Phenylketonuria
- b) Albinism
- c) Hypertrichosis
- d) G6PD Deficiency

Chorionic Villi Sampling can be safely performed in which period of gestation?

- a) 9.5-12.5 Weeks
- b) 16-18 Weeks
- c) 18-20.5 Weeks
- d) 17.5-18.5 Weeks

What is the term for the failure of two homologous chromosomes or sister chromatids to separate during cell division?

- a) Inversion
- b) Polyploidy
- c) Non-disjunction
- d) Translocation

Which website provides detailed, full-text, references overview of all Mendelian disorders?

- a) NCBI
- b) OMIM
- c) DDBJ
- d) ExPASy

Which of the following is not an application of bioinformatics websites?

- a) Protein modeling
- b) Genome mapping
- c) Disease diagnosis.
- d) Drug discovery.

Which of the following is a primary protein sequence databases?

- a) GenBank
- b) PIR
- c) EMBLEBI
- d) DDBJ

Which of the following is a ungapped multiple alignment of related protein segments that corresponds to the most highly conserved regions of the proteins?

- a) BLOCKS
- b) PROSITE
- c) PDB
- d) CATH

Which of the following sequence similarity search is performed by TBLASTN?

- a) Searches and compares a nucleotide query against the nucleotide database.
- b) Searches a nucleotide query against a protein database by translating the query.
- c) Searches a protein query against a nucleotide database by translating the database.
- d) Searches and compares a protein query against the protein database.

Which technology provides a versatile platform for characterization of thousands of proteins in a parallel and high-throughput way?

- a) RT-PCR
- b) ELISA
- c) DNA Microarray
- d) Protein Microarray

Which of the following types of mutations involves loss or gain of a single nucleotide or nucleotide pair?

- a) Genomic mutation
- b) Point mutation
- c) Aneuploidy
- d) Chromosomal aberration

The FMR1 gene (fragile X mental retardation) in normal individual has how many CGG repeat?

- a) 6-46
- b) 100-150
- c) 200-400
- d) 500-1000

Which of the following aberration occurs in the DNA due to ionizing radiation?

- a) DNA deamination
- b) DNA methylation
- c) Double-strand breaks
- d) Thymine dimer

Which of the following enzymes protect DNA against oxidative damage?

- a) Superoxide dismutase and Catalase
- b) Methylase and Esterase
- c) Amylase and Chymase
- d) DNA ligase and Nuclease

What is the common term used for stringent plasmids?

- a) Single copy plasmid
- b) Relaxed plasmid
- c) Bridge plasmid
- d) Linear plasmid

Who coined the term “ Western Blot”?

- a) E. Southern
- b) F. Sanger
- c) W. Neal Burnette
- d) George Stark

What is the application of PCR Technique?

- a) Separation of molecule of interest
- b) Radiolabelling
- c) Gene amplification
- d) gene insertion

Which of these process leads to loss of a segment or a portion of chromosome?

- a) Deletion
- b) Duplication
- c) Translocation
- d) Inversion

Which of these disorder is caused due to single gene mutation?

- a) Breast cancer
- b) Turner's syndrome
- c) Cystic fibrosis
- d) Down's syndrome

Which of these test helps to identify the disease causing mutation due to premature protein translation termination?

- a) Banding
- b) FISH
- c) PTT
- d) Amniocentesis

Which of the following primary databases of nucleotide sequences?

- a) UniProtKB
- b) GenBank
- c) PROSITE
- d) PIR

Which of the following is used to identify regions of similarity that may indicate functional, structural or evolutionary relationship between two biological sequences?

- a) Multiple sequence alignment
- b) Global alignment
- c) Local alignment
- d) Pairwise sequence alignment

What is proteomics?

- a) The study of the entire set of proteins produced by a cell.
- b) The study of the entire set of genes present in a cell.
- c) The study of the entire set of RNA synthesized by a cell.
- d) The study of the entire set of metabolites produced by a cell.

Name the enzyme that makes a DNA strand using mRNA as a template strand and requires Mg and Mn for initiation of transcription?

- a) Terminal Transferase
- b) Reverse Transcriptase
- c) Alkaline phosphatase
- d) Polynucleotide Kinase

Which of the following is an intercalating agent that causes DNA mutation?

- a) Bromophenol blue
- b) Ethidium bromide
- c) Eosin
- d) Methylene blue

In which of the following types of mutation there is substitution of one pyrimidine by another pyrimidine, or one purine by another purine?

- a) Transition mutation
- b) Chromosomal aberration
- c) Protein mutation
- d) Transversion mutation

The fragile X syndrome results from the expansion of which trinucleotide repeat?

- a) GCC
- b) CGG
- c) GAC
- d) CAG

The 5-bromouracil is an analog of which of the following nitrogen base?

- a) Thymine
- b) Adenine
- c) Guanine
- d) Cytosine

Which of the following enzyme is responsible for repairing the pyrimidine dimers formed in DNA by ultraviolet light?

- a) Phosphatase
- b) Photolyase
- c) DNA ligase
- d) methyltransferase

Which of the following is used in reaction mixture for PCR?

- a) Acid phosphatase
- b) Taq DNA Polymerase
- c) PNK
- d) T4 DNA Ligase

Which of the following is used in chemical treatment for DNA sequencing by Maxam-Gilbert method?

- a) Taq DNA polymerase
- b) DNA primers
- c) Piperidine
- d) FDNB

Which of the following is the source for *Hind III*?

- a) *Haemophilus influenzae* Rd
- b) *Haemophilus aegyptius*
- c) *Haemophilus albidum*
- d) *Serratia marcescens*

Which of these abnormalities leads to cat cry syndrome?

- a) Long arm deletion
- b) Deletion of 4p
- c) Loss of chromosome 18
- d) Short arm deletion

Which of these disorder is caused when a person receives two copies of chromosome from a single parent?

- a) Uniparental disomy
- b) Diparental monosomy
- c) Uniparental monosomy
- d) Diparentaldisomy

Which of these technique reveals morphological features and finer details of the chromosome?

- a) Microarray
- b) Banding technique
- c) Ideogram
- d) Karyotyping

Which of the following primary databases of protein sequences?

- e) UniProtKB
- f) GenBank
- g) PROSITE
- h) BLOCKS

Which of the following involves alignment of three or more biological sequences of similar length?

- e) Pairwise sequence alignment
- f) Global alignment
- g) Multiple sequence alignment
- h) Local alignment

What is metabolomics?

- e) The study of the entire set of proteins produced by a cell.
- f) The study of the entire set of genes present in a cell.
- g) The large-scale study of the metabolites produced by a cell.
- h) The study of the entire set of RNA synthesized by a cell.

What does chronic villi sampling mean?

- a) A diagnostic process in which a hollow needle is inserted into the uterus, to collect amniotic fluid present around the developing fetus.
- b) A treatment process in which a hollow needle is inserted into the uterus, to inject the medicine.
- c) A diagnostic process in which a catheter is passed into the uterus, to collect cells from placental villi.
- d) A treatment process to clean theuterus in case of miscarriage.

Which of the type of evolution is a process whereby organisms not closely related, independently evolve similar traits as a result of having adapted to similar environments or ecological niches?

- a) Convergent evolution
- b) Independent evolution
- c) Parallel evolution
- d) Divergent evolution

In which of the following types of mutation a purine is replaced by a pyrimidine or vice versa?

- a) Aneuploidy
- b) Transversion mutation
- c) Protein mutation
- d) Transition mutation

The Huntington disease results from the expansion of which trinucleotide repeat?

- a) CGG
- b) GCC
- c) CAG
- d) GAC

Which of the following agent is a DNA deaminating agent?

- a) Nitrous acid
- b) Hydrogen peroxide
- c) Mustard gas
- d) Ethidium bromide

The proteins mutS, mutH and mutL are involved in which of the following type of DNA repair?

- a) Mismatch repair
- b) Recombination repair
- c) Nucleotide excision repair
- d) SOS repair

Who developed the technique of Northern Blotting?

- a) Edward Southern
- b) Edward Northern
- c) J. Alwine, David Kemp, George Stark
- d) Harry Towbin

Which of the following is used in chemical treatment for DNA sequencing by Maxam-Gilbert method?

- a) Taq DNA polymerase
- b) DNA primers
- c) DMS
- d) FDNB

What is ori gene?

- a) Antibiotic resistant gene
- b) Origin of replication

- c) Ongoing resistance indicator
- d) Origin of translation

State the use of FISH technique?

- a) To identify defect in neural tube.
- b) To detect change in structure of chromosome.
- c) To identify numerical change in chromosome.
- d) To identify defect in a particular gene

Which of these factor is responsible for Robertsonian translocation?

- a) Translocation among acrocentric chromosome.
- b) Translocation among metacentric chromosome.
- c) Translocation among submetacentric chromosome.
- d) Translocation among telocentric chromosome.

Which of following disease is caused due to absence of melanin pigment?

- a) PKU
- b) Albinism
- c) Alkatonuria
- d) melaptonuria

Which of the following derived database?

- i) GenBank
- j) UniProtKB
- k) PIR
- l) BLOCKS

Which of the following diagram shows the evolutionary interrelations of a group of organisms derived from common an ancestor?

- i) Dendrogram
- j) Pictogram
- k) Hologram
- l) Cardiogram

What is transcriptomics?

- i) The study of the entire set of proteins produced by a cell.
- j) The study of the entire genome of an organism.
- k) The large-scale study of the metabolites produced by a cell.
- l) The study of the entire set of RNA transcripts produced by a cell.

Who requires genetic counseling?

- a) One who wants to identify the gender of the fetus
- b) Juvenile with a genetic disorder.

- c) A new born to treat its psychological issues.
- d) One planning for a child and have known risk of family genetic disorder.