1. Variant type with most danger sequence:
   a. Benign
   b. Likely benign
   c. Likely pathogenic
   d. Pathogenic
   e. Variant of unknown signific

2. Human mutation characterized by all except:
   a. Mostly neutral
   b. Harmful mutation
   c. Defective protein function mostly
   d. Protec against genetic disorder
   e. Associated with many type of cancer

3. One 15^{th} chromosome larger than usual due to connected to 21 pair, what the type of mutation:
   a. Translocation
   b. Duplication
   c. Insufficiency

4. Mutation has no effect on protein the gene code for, what factor related to that:
   a. Rare mutation
   b. Amino acid have more than 1 codon
   c. Correcting mechanism
   d. A+B
   e. A+B+C

5. Next generation sequence setup require:
   a. Extensive Bioinformatic analysis
   b. Library prepared

c. A+b true
d. B+a false

6. Major conclusion of human genome project:
   a. Fewer gene than estimated
   b. Gene encode complex protein
   c. 99% of human genome identical
   d. Contain a lot of repeated
   e. All of above

7. There is 3 alleles locus on c chromosome that control green light sensitivity , if G is normal dominant allele ,g1: a green shift mutation-weakened green sensitivity where only 2 shades are distinguished,g1 is dominant to g2:blindness where red,green,yellow can't be seen !!what is true, they specified it to males only?
   a. half will have green shift mutation, half blind
   b. all blind if it was specified for males
   c. all normal

8. term for condition that affect multi organs
   a. pleiotropy
   b. polygenic inheritance
   c. co dominant
   d. linkage disease
   e. genetic imprinting.

9. Nonsense mutation involve:
   a. Creation of different amino acid
   b. Regulatory sequence
   c. Stop coding

10. Nucleotide repeated sequence 2,3 or 4, 6p:

a. SNP
b. Micro stellate

11. Triple repeated, character:
    a. Severity worsen in subsequent generation
    b. Disorder appear to have skipped generation
    c. More likely with paternal aging
    d. Reduced male

12. Feature with marfan syndrome:
    a. PNS tumor & benign
    b. Abnormal heart structure & elongated vessels

13. Cristea site for:
    a. Macromolecule breakdown
    b. Protein synthesis
    c. Oxidation-reduction reaction site
    d. Flevo protein phosphorylation

14. Bill has BOR syndrome, he has bilateral hypoplasia & deaf. His mother mild hearing loss & missing one kidney. Father history of neck cyst resected when was boy? Which genetic concept this case represent?
    a. Pleiotropy
    b. Allele heterogeneity
    c. Heteroplasmy
    d. Variable expressivity

15. to describe disease influenced by genetic and environmental causes , this states:
    a. Multifactorial
    b. polygenic Inheritance

c. pleiotropy
d. Co dominant
e. epigenetic

16. Stepwise of genomic:
    a. Genome sequence, disease causation & treatment
    b. Genome sequence, annotation, variation, genotype, phenotype correlation
    c. None of above

17. Mitochondria is 16659 base pair long, has these gene except:
    a. 22Trna
    b. 2rRNA
    c. 13 protein coding gene
    d. ATPase

18. LHON caused by defect in all of these mitochondrial gene except:
    a. ATP6
    b. ND1
    c. ND4
    d. ND6

19. CORONARY HEART diseases has several genes causing it , this concept is :
    a. polygenic inheritance
    b. epigenetic
    c. Co dominant
    d. multiple alleles

20. an autosomal dominant disease:
    a. Huntington's disease
    b. Duchene
    c. Cystic fibrosis
    d. Tay Sachs

e. hemophilia

21. ..one of the following Nucleotide transversions is miss matched "not sure of the full question"
    a. C-T
    b. A-T
    c. C-G

22. 2 different mutation that happen on the same locus, the first mutation lead to sickle cell anemia, and the other lead to thalassemia, example of:
    a. Locus mutation
    b. Allele heterogeneity

23. True about hemophilia A:
    a. M more than F
    b. F more than M
    c. Females are the only carrier

    Both answers a+b are correct

24. Mitochondrial DNA genome:
    Simple ds circular DNA

25. Feature associated with albinism:
    Inability to produce sufficient melanin

26. Phenomenon occur when expression of one gene mask or alter expression of another gene:
    Epistasis

27. Most commonly accruing variant in human genome:
    Single-nucleotide polymorphism

28. Most frequent type of genetic variant:
    SNPs

29. Autosomal recessive disease:
Cystic fibrosis

30. Consanguinity associated with:
Autosomal recessive disorder

31. Feature of Duchenne muscular dystrophy:
Muscle weakness & loos coordination

32. 2different mutation one on FGFR2 and other on FGFR3, both leading to develop the same disease, example of:
Locus heterogeneity

33. Example of epistasis:
ABO blood group mask expression of MN gene

34. Purpose of x-inactivation in female:
Prevent overexpression of x in female

35. Number of mitochondria in cell depend on
Function state

36. Tay-Sachs is caused by which gene:
HEX A

37. De novo disease
Achondroplasia

38. Regarding autosomal dominant which is wrong:
Only homozygous patients are affected

39. true about Co dominant alleles they were 2 alleles with colors “not sure “:
They both contribute in the phenotype was the best choice

40. question about d-loop (was T OR F)

- our exam was 50 question
- ANOTHER left question all were about pedigree and they were easy to answer & solve it

1	D	11	A	21	A
2	D	12	B	22	B
3	A	13	C		
4	B	14	D		
5	C	15	A		
6	E	16	B		
7	B	17	D		
8	A	18	A		
9	C	19	A		
10	B	20	A		