Faculty of Stomatology
Department of Molecular and Medical Genetics
Typical Exam Tests
Genetics 1

1. The functional unit of heredity is a: A. Nucleus; B. Nucleotide; C. Gene; D. Chromosome.

2. Which term describes the entire collection of DNA contained within an organism?
   A. Genotype; B. Clone; C. Gene; D. Genome.

3. Meiosis is involved in which of the following life cycle events?
   A. Spermatogenesis; B. Cell regeneration; C. Growth; D. Development.

4. If a mother cell has 14 chromosomes prior to mitosis, how many chromosomes will the daughter cell have?
   A. 28; B. 14; C. 7; D. any number between 7 and 28.

5. Which of the following corresponds to the alternative form of a gene?
   A. Non-allele; B. Compound; C. Hemizygote; D. Allele.

6. Which type of bond joins two strands of DNA?
   A. Covalent bond; B. Phosphodiestherbond; C. Ionic bond; D. Hydrogen bond.

7. Change in sequence of nucleotide in DNA is called as: A. Mutagen; B. Mutation; C.Recombination; D. Translation.

8. The replication of DNA is possible due to:
   A. Hydrogen bonds; B. Phosphate backbone;
   C. Complementary base pair rule; D. The helical nature of the DNA double strand.

9. What is an intron?
   A. It is region of DNA located between genes that is not translated into protein;
   B. It is region of DNA located within a genes that is not translated into protein;
   C. It is a regulatory gene; D. It is a structural gene.

10. Which of the following is a gene coding region? A. Intron; B. Exon; C. Codon; D. Anticodon.

11. RNA synthesis from a DNA template is called:
    A. Translation; B. Replication; C. Transcription; D. Transduction.

12. Which of the following processes take part in the nucleus of a cell?
    A. Translation; B. RNA splicing; C. Posttranslational processing; D. Binding of amino acids with tRNA.

13. Each nucleotide triplet in mRNA that specifies a particular amino acid is called:
    A. Mutagen; B. Codon; C. Anticodon; D. Exon.

14. How are mtDNA distributed to the daughter cells during mitosis?
    A. Non-randomly; B. Both cells receive exactly same amount and type of mitochondria;
    C. Randomly; D. Larger size mitochondria go to one cell and smaller ones go to another cell.

15. An octamer of 4 histones complexed with DNA forms:
    A. Endosome; B. Mesosome; C. Nucleosome; D. Centromere.

16. DNA methylation may be a significant mode of genetic regulation in eukaryotes. Methylation refers to:
A. Altering RNA polymerase activity by methylation;
B. Changes in DNA-DNA hydrogen binding;
C. Altering translational activity, especially of highly methylated tRNAs;
D. Addition of methyl groups to the cytosine of CG doublets.

17. A mutation is defined as:
A. A change in an organism's DNA sequence; B. The growth of an abnormal cell structure;
C. The changing of a cell from one type to another; D. A way of changing mRNA to proteins.

18. Which of the following mutation affects only a single nucleotide?
A. Conditional mutation; B. Germline mutation; C. Point mutation; D. Regional mutation.

19. An allele is considered polymorphic when its frequency in the population is:
A. Less than 1%; B. More than 1%; C. Less than 10%; D. Somewhere between 10-20%.

20. A genetic disease that is either present or absent is referred to as:
A. Concordance; B. Discordance; C. Quantitative traits; D. Qualitative trait.

21. When only one member of the pair of relatives is affected and the other is not, the relatives are:
A. Concordant; B. Discordant; C. Quantitative traits; D. Qualitative trait.

22. In the human blood type AB, the alleles are: A. Sex-linked; B. Codominant; C. Polygenic; D. Dominant.

23. Which of the following is NOT true about cleft lip/palate (CL/P)?
A. It may be syndromic or nonsyndromic; B. It may be caused by both genetic and environmental factors;
C. It is a very rare congenital malformation; D. Most cases of nonsyndromic CL/P demonstrate familial aggregation.

24. Cancer is caused by:
A. Uncontrolled mitosis; B. Uncontrolled meiosis; C. Rupturing of cells; D. Degradation of cells.

25. Which one of the following statements best describes most malignant neoplasms?
A. They are associated with constitutional chromosomal abnormalities; B. They are of multifactorial etiology;
C. They are due to an inherited mutation of an oncogene; D. They result from activation of tumor suppressor genes.

26. Which type of mutation is characteristic to tumor-suppressor genes?
A. Loss-of-function mutation; B. Gain-of-function mutation;
C. Novel property mutation; D. Heterochronic mutation.

27. Which of the following definitions best describes set of alleles, that form a gentic constitution of an individual?
A. Phenotype; B. Genotype; C. Compound; D. Heterozygote.

28. Which of the following definitions best corresponds to an individual's morphological characteristic?
A. Heterozygote; B. Homozygote; C. Phenotype; D. Genotype.

29. Which of the following corresponds to an individual with identical pair of alleles?
A. Homozygote; B. Heterozygote; C. Hemizygote; D. Diheterozygote.

30. Which of the following is an individual with nonidentical pair of alleles?
A. Homozygote; B. Heterozygote; C. Hemizygote; D. Diheterozygote.

31. According to the X-linked genes males are:
A. homozygotes; B. Heterozygotes; C. Hemizygotes; D. Compounds.

32. A human male carrying an allele for a trait on the X chromosome is:
A. Heterozygous; B. Homozygous; C. Hemizygous; D. Monozygous.

33. What happens to the extra X chromosome in patients with additional X chromosome?
A. Almost entire chromosome is inactivated; B. p arm is inactivated;
C. Region near the centromere is inactivated; D. q arm is inactivated.

34. Which of the following type of inheritance is characterized by the fact, that the parents of an affected child are asymptomatic carriers of mutant alleles?
A. Autosomal Dominant Inheritance; B. Autosomal Recessive Inheritance;
C. Genomic imprinting; D. X-Linked Recessive Inheritance.

35. Which of the following types of inheritance best corresponds to the statement: each affected individual has an affected parent? A. Autosomal-dominant; B. Autosomal-recessive; C. X-linked recessive; D. Y-linked.

36. Which of the following type of inheritance is characterized by the fact, that the sons of the affected fathers are healthy and the daughters may be affected?
A. X-Linked Recessive Inheritance; B. Autosomal Dominant Inheritance;
C. Autosomal Recessive Inheritance; D. Genomic imprinting.

37. Couples who have one or more ancestors in common are called:
A. Pedigree; B. Kindred; C. Sibship; D. Consanguineous.

38. Anticipation is characteristic of conditions caused by:
A. Microdeletions; B. Mitochondrial inheritance; C. Genomic imprinting; D. Trinucleotide repeat expansions.

39. The most common heritable form of moderate mental retardation and is second only to Down syndrome among all causes of mental retardation in males:
A. Patau syndrome; B. Edward syndrome; C. Myotonic dystrophy; D. Fragile X syndrome.

40. Which disease is most commonly associated with a mutation-induced alteration of a protein by expansion of an unstable repeat: A. Cystic fibrosis (CF); B. Huntington disease; C. Phenilketonuria (PKU); D. Tay-Sachs disease.

41. Which of the following chromosomal trisomies causes Down syndrome?
A. 18 chromosome trisomy; B. 13 chromosome trisomy;
C. 21 chromosome trisomy; D. 22 chromosome trisomy.

42. Exchange of segments between non-homologous chromosomes is called:
A. Crossing-over; B. Inversion; C. Duplication; D. Translocation.

43. In which of the following the short arms of two acrocentric chromosomes break and the long arms join, forming an unusual, long chromosome: A. Reciprocal translocation; B. Robertsonian translocation; C. Inversion; D. Duplication

44. Which of the following statements is true about sex determination?
A. It is the presence of second X chromosomes that determines the femaleness;
B. It is the presence of Y chromosome that determines the maleness;
C. It is the lack of X chromosome that determines the maleness; D. Both A and C are correct.

45. What is the number of Barr bodies (inactive X) in Kleinfelter syndrome? A. 0; B. 1; C. 2; D. 3.

46. Which is **NOT** a feature of Kleinfelter syndrome?
A. Short height; B. Gynecomastia; C. Long, thin fingers, arms and legs; D. Small testes.

47. In general, full monosomies are not compatible with life and cause fetal death. Which of the following chromosomal monosomies is an exception and can produce a liveborn infant?
A. X chromosome monosomy; B. 21 chromosome monosomy;
C. 22 chromosome monosomy; D. 17 chromosome monosomy.

48. In general, full monosomies are not compatible with life. Which of the following chromosomal monosomies is an exception?
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    C. X chromosome monosomy; D. 17 chromosome monosomy.

49. Why would you predict that half of the human babies born will be males and half will be females?
    A. Because all eggs contain an X chromosome;
    B. Because of the formation of the Barr body early during embryonic development;
    C. Because of the segregation of the X chromosomes during female meiosis;
    D. Because of the segregation of the X and Y chromosomes during male meiosis.

50. The Barr body is:
    A. An amplified gene; B. A polytene chromosome;
    C. A ribonucleoprotein particle; D. n inactivated X chromosome.

51. Which of the following genome anomalies are most common?
    A. Poliploidy; B. Euploidy; C. Aneuploidy; D. Monoploidy.

52. The error in meiosis that produces a 47, XYY karyotype is best described by which of the following?
    A. Meiosis division I of paternal spermatogenesis; B. Meiosis division I of maternal oogenesis;
    C. Meiosis division II of paternal spermatogenesis; D. Meiosis division II of maternal oogenesis.

53. Which change in the polipeptide chain is characteristic to HbS that causes sickle-cell disease:
    A. Beta chain: Glu66Lys; B. Beta chain: Glu6Val; C. Beta chain: His92Tyr; D. Beta chain: Glu2Lys.