СТОМ-21 ИН

Federal State Budgetary Educational Institution of Higher Education
«North-Ossetia State Medical Academy»
of the Ministry of Healthcare of the Russian Federation

Department of Biology and Histology

Approved by
The protocol of the meeting of the
Central Coordination Training
and Methodological Council
№5 in 23.05.2023

ASSESSMENT TESTS

«Biology»
the main professional educational program of higher education - specialty program in the specialty 31.05.03 Dentistry, approved in 24.05.2023

For the first year students who study in English

Considered and approved at the meeting of the department
22.05.2023 (protocol №10)

Head of the department
D.M.S. professor_____ (L.V. Bibaeva)

Vladikavkaz

THE STRUCTURE OF THE ASSESSMENT TESTS

1. Title page
2. The structure of the assessment tests
3. A review of the assessment tests
4. The passport of the assessment tests
5. *The set of the assessment tests*
    - questions for modules/exam
    - collections of problems/practical tasks/interactive games
    - collection of tests
        - Entrance tests
        - Tests for current control

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ «СЕВЕРО-ОСЕТИНСКАЯ ГОСУДАРСТВЕННАЯ МЕДИЦИНСКАЯ АКАДЕМИЯ» МИНИСТЕРСТВА ЗДРАВООХРАНЕНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

РЕЦЕНЗИЯ
на оценочные материалы

По биологии
Для --студентов 1 курса
По специальности -31.05.03 Стоматология (специалитет)

Оценочные материалы составлены на кафедре биологии и гистологии на основании рабочей программы дисциплины биология основной профессиональной образовательной программы высшего образования –программы специалитета по специальности 31.05.03 Стоматология, (образовательной программы, частично реализуемой на английском языке) и соответствует требованиям ФГОС ВО по специальности 31.05.03 Стоматология (специалитет) утвержденному Министерством образования и науки Российской Федерации «12» августа 2020 г. № 984.

Оценочные материалы включают в себя вопросы к модулю, банк ситуационных задач/практических заданий/деловых игр, эталоны тестовых заданий (с титульным листом и оглавлением), экзаменационные билеты.

Банк тестовых заданий включает в себя следующие элементы: тестовые задания, варианты тестовых заданий, шаблоны ответов. Все задания соответствуют рабочей программе по биологии и охватывают все её разделы. Количество тестовых заданий составляет 247. Сложность заданий варьируется. Количество заданий по каждому разделу дисциплины достаточно для проведения контроля знаний и исключает многократное повторение одного и того же вопроса в различных вариантах. Банк содержит ответы ко всем тестовым заданиям и задачам.

Количество экзаменационных билетов составляет 30, что достаточно для проведения экзамена и исключает неоднократное использование одного и того же билета во время экзамена в одной академической группе в один день. Экзаменационные билеты выполнены на бланках единого образца по стандартной форме, на бумаге одного цвета и качества. Экзаменационный билет включает в себя 2 теоретических вопроса по разным разделам программы, что позволяет более полно охватить материал дисциплины. Формулировки вопросов совпадают с формулировками перечня вопросов, выносимых на экзамен.

Дополнительно к теоретическим вопросам предлагаются 1 задача по разделу генетика. Задачи, включенные в экзаменационный билет, дают возможность объективно оценить уровень усвоения студентом теоретического материала.

Сложность вопросов в экзаменационных билетах распределена равномерно. Замечаний к рецензируемому фонду оценочных средств нет. В целом, фонд оценочных средств по дисциплине биология способствует качественной оценке уровня владения обучающимися профессиональными компетенциями.

В целом, оценочные материалы способствуют качественной оценке уровня владения обучающимися универсальными, общепрофессиональными и профессиональными компетенциями.

Рецензируемые оценочные материалы по дисциплине биология могут быть рекомендованы к использованию для промежуточной аттестации на стоматологическом факультете у студентов 1 курса, обучающихся на английском языке.

Рецензент:
Председатель ЦУМК естественнонаучных
и математических дисциплин с подкомиссией
по экспертизе оценочных средств,
доцент кафедры химии и физики Н.И. Боциева

ВЕРНО: специалист по кадрам отдела кадров и документооборота ФГБОУ ВО СОГМА Минздрава России
_____ «___» _____ 20___ г.

ОТДЕЛ КАДРОВ И ДОКУМЕНТООБОРОТА

3

The passport of the assessment tests
discipline -biology

№№ p/p	Name of the controlled section (topic)discipline / module	Competency index	Name of the fund of assessment tests
1	2	3	4
Type of control-current/intermediate			
1.	Cell biology. The main characteristics of living substances. Levels of biological organization. Cellular organization of living matter.	UC-1 GPC-8	• questions for modules • collections of problems/practical tasks/interactive games • collection of tests • examination tickets
	Cell biology. The structural organization of hereditary material and realization of biological information in cells		
	Cell biology. Reproduction is the common property of living organisms. Cell cycle. Mitosis. Meiosis		
2.	Ontogenesis. General patterns of embryonic development. Regulation of ontogenesis.	UC-1 GPC-8	• questions for modules • collections of problems/practical tasks/interactive games • collection of tests • examination tickets
3.	Medical genetic. Monogenic and polygenic inheritance. Entangled inheritance. Sex-Linked Genetics. Regularities and mechanisms of variability.	UC-1 GPC-8	• questions for modules • collections of problems/practical tasks/interactive games • collection of tests • examination tickets
4.	Fundamentals of General and medical ecology. Medical parasitology. Medical protozoology. Medical helminthology. Medical Arachno-Entomology.	UC-1 GPC-8 PC-1	• questions for modules • collections of problems/practical tasks/interactive games • collection of tests • examination tickets
5.	Evolution theory. Anthropogenesis. Phylogenesis of organs and functional systems. The phylogenesis of the circulatory, urogenital, and nervous systems.	UC-1 GPC-8	• Examination tickets

QUESTIONS FOR MODULES

Questions to part
«Cytology»

a. What is a cell? Types of cellular organization. Structural features of Pro-and eukaryotes.
b. What are the main provisions of cell theory?
c. Structure and composition of the core.
2. Structure and composition of the cell membrane.
3. The structure and composition of the cytoplasm.
4. The structure and function of membrane organelles:
    a. Mitochondria
    b. ER
    c. The Golgi Complex
    d. Lysosomes
    e. Structure and functions of non-membrane organoids.
    f. Ribosomes
    g. Cell center
    h. Microtubules
5. Inclusions, their types and meaning.
6. Nucleic acid. Nucleotide, its constituent parts.
7. Spatial organization of nucleic acid molecules. Primary, secondary, tertiary DNA structures (complementarity, antiparallel).
8. Replication of DNA.
9. The types of RNA. Their structure and function
10. Gene level of organization of hereditary material. Gene, definition. Simple and complex features.
11. Genetic code and its properties.
12. The protein biosynthesis in the cell-transcription. processing
13. Translation: initiation, elongation, termination of polypeptide molecule Assembly.
14. Gene mutations, their mechanisms and effects on the body. Examples of gene diseases.
15. Describe the different types of chromatin.What is a sex chromatin? How is it defined?
16. The structure and shape of chromosomes during cell division.
17. Give the definition of the karyotype, genotype, gene. Describe the human karyotype.
18. What are chromosomal aberrations, their varieties? What are the mechanisms of their occurrence?examples of diseases caused by chromosomal mutations.
19. What is a genome mutation? Classification of genomic mutations.
20. Mechanisms of genomic mutations? Diseases caused by genomic mutations.
21. Cytogenetic research method? When is it applied?
22. What is interphase? What processes occur in:
    a. G1-period
    b. S-period
    c. G2-period
23. What is mitosis? Biological meaning of mitosis.
24. What is reproduction? Methods and forms of reproduction.
25. The features of sexual reproduction.
26. What are gametes? How do they differ from other cells in the body?
27. Describe the structure and function of the male gametes.
28. Structure and functions of the female gametes.
29. What is gametogenesis? In what organs does it occur?To characterize the stages of gametogenesis.
30. What is meiosis? At what stage of gametogenesis does it occur? Signification of meiosis.

Questions to part
«Genetics»

1. What are allelic genes? How many different alleles of the same gene can be present in the genotype of the body? Dominant and recessive allele?
2. What are the laws of inheritance discovered by Mendel:
   a) Give the wording of the law I. Cytological basis.
   b) Give the wording of the law II. Cytological basis.
3. What is crossbreeding analysis? In what cases is it used?
4. Chromosomal mechanisms for sex determination? Features of male and female karyotypes.
5. What are the characteristics of the X- and Y-linked inheritance?
6. What is the genealogical method and what are its possibilities?
7. Characteristics of the autosomal dominant type of inheritance.
8. Characteristics of the autosomal recessive type of inheritance.
9. Characteristic of x-linked inheritance.
10. Characteristic of the holandric type of inheritance.
11. Formulate the law of Mendel's law of independent assortments.
12. The mechanism of formation of gametes in the independent inheritance of features. How this is determined by the number of gametes.
13. What are the cytological mechanisms of combinative variability?
14. Chromosome theory of inheritance. The main provisions of chromosomal theory.
15. In some cases, genes are inherited independently, and in some – linked? In some cases, there is a complete and incomplete adhesion of genes?
16. What is the gene balance of the body and what are the consequences of its violations?
17. What is incomplete dominance?
18. What is codominance?
19. Characterize the phenomenon of multiple alleles.
20. How does the inheritance of blood groups in the ABO system in humans?
21. What is epistasis? Give examples of dominant and recessive epistasis.
22. What is complementarity?
23. Explain the phenomenon of polymer (polygenic inheritance).
24. What is pleiotropy?
25. What is variability? Biological significance of variability, classification.
26. Modification variability. Characteristics of modifications.
27. The penetrance and expressivity.
28. Mutational variability. Characteristic of mutations. Mutagenic factors.
29. Features of man as an object of genetic research
30. Genealogical method and its application in medical genetic counseling.
31. What is the twin method of human genetics and for what purpose it is used? Monozygous and dizygotic twins. Give the definition of " concordance and discordance»
32. Population-statistical method. Hardy-Weinberg Law.
33. Biochemical research method. Scope of application.

Questions to part
«Ontogenesis»

1. Ontogenesis, definition, periodization, types of postnatal ontogenesis.
2. Fertilization, definition, stages, biological essence.
3. Cleavage, mechanisms and value.
4. Dependence of the cleavage method on the type of egg cell. The main types of blastulas
5. Features of cleavage in human.
6. Gastrulation, types of formation of gastrula, significance.
7. Morphology of gastrula.
8. Gastrulation in Mammals
9. The types of formation of mesoderm, its differentiation.
10. Neurulation. Neurula.
11. Histo- and organogenesis.
12. Molecular and genetic mechanisms of cell differentiation.
13. Derivatives of ectoderm;
14. Derivatives of endoderm;
15. Derivatives of the mesoderm.
16. Describe group: anamnia and amniota.
17. Provisory organs of vertebrate embryos.
18. Yolk sac, its morphology and functions. Pathology of yolk sac (Meckel's diverticulum, umbilical vesicle, umbilical fistula).
19. Amnion, its morphology and functions. Pathology of amnion.
20. Allantois, its morphology and functions. Pathology of allantois.
21. Chorion, its morphology and functions. Pathology of chorion.
22. Critical periods of ontogenesis. Teratogenic factors.

Questions to part
«Protozoology»

1. Describe the types of biotic bonds. Given example.
2. What is parasitism? Classification of parasitism and parasites. Classification of owners.
3. Describe the methods of transmission of the pathogen.
4. Give a General description of the Protozoa. Taxonomy of Protozoa.
5. To characterize the PHYLUM SARCOMASTIGOPHORA, class SARCODINA. Which members of the class are human commensals?
6. Characterize the morphological forms of Entamoeba histolytica. Describe the life cycle of Entamoeba histolytica. Symptoms, diagnosis and prevention of amoebiasis.
7. Characterize the PHYLUM CILIOPHORA.
8. Describe the morphology and life cycle of Balantidium coli. Symptoms of balantidiasis. Diagnosis and prevention.
9. Give a General description of the PHYLUM APICOMPLEXA (SPOROZOA).
10. Morphology, life cycles of Plasmodium vivax, Plasmodium ovale, Plasmodium malariae, symptoms, pathogenesis, laboratory diagnosis and prevention of malaria.
11. Morphology, life cycles of Toxoplasma gondii. Symptoms, pathogenesis, laboratory diagnosis and prevention of toxoplasmosis
12. Give a General characterization of the class of FLAGELLATES.
13. Giardia lamblia: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of giardiasis.
14. Trichomonas vaginalis: morphology, life cycle. Symptoms, pathogenesis, labora-tory diagnosis and prevention of trichomoniasis.
15. Trichomonas hominis: morphology, life cycle. Trichomonas tenax: morphology, life cycle.
16. Morphologic types in hemoflagellates: amastigote, promastigote, epimastigote, trypomastigote.
17. Leishmania tropica: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of cutaneous leishmaniasis.
18. Leishmania donovani: morphology, life cycle. Symptoms, pathogenesis, laborato-ry diagnosis and prevention of visceral leishmaniasis.
19. Morphologic types in hemoflagellates: amastigote, promastigote, epimastigote, trypomastigote.
20. Trypanosoma brucei gambience, Trypanosoma brucei rhodesience: morpholo-gy, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of af-rican trypanosomiasis.
21. Trypanosoma cruzi: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of american trypanosomiasis

Questions to part
«Helminthology»

1. Give a General description of the type of Flat worms. What are the classes divided? What are the examples of the type of parasites in humans?
2. Give a General characteristics of the class of FLUKES.
3. Fasciola hepatica: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of fascioliasis.
4. Paragonimus westermani: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of paragonimiasis.
5. Opisthorchis felineus: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of opisthorchosis.
6. Clonorchis sinensis: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of clonorchosis
7. Schistosoma mansoni, Schistosoma japonicum, Schistosoma haematobium: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of schistosomiasis.
8. Dicrocoelium dendriticum: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of dicrocoeliosis
9. Give General characteristics of the class of TAPEWORMS. What features of the morphology of representatives of this class are associated with a parasitic lifestyle?
10. Characterize the structure of scolex, hermaphrodite and Mature segments of Taenia.
11. Taenia saginata: morphology, life cycle.
12. Taenia solium: morphology, life cycle.
13. Symptoms, pathogenesis, laboratory diagnosis and prevention of taeniasis and cysticercosis.
14. Hymenolepis nana: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of hymenolepiasis.
15. Diphyllobothrium latum: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of diphyllobothriasis.
16. Echinococcus granulosus: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of echinococcosis.
17. Features of the organization of representatives of the Type of ROUNDWORMS.
18. Ascaris lumbricoides: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of ascariasis.
19. Enterobius vermicularis: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of enterobiasis.
20. Trichuris trichiura: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichuriasis.
21. Trichinella spiralis: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichinellosis.
22. Wuchereria bancrofti: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of filariasis.
23. Loa loa: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of loiasis.
24. Onchocerca volvulus: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of onchocerciasis.
25. Dracunculus medinensis: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of dracunculiasis.
26. Ancylostoma duodenale: morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of ancylostomiasis

EXAMINATION QUESTIONS

1. The types of cell organization. Prokaryotic cells, their structure and typical features.
2. Trichinellosis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis,laboratory diagnosis and prevention of trichinellosis.
3. The types of cell organization. Eukaryotic cells, their structure and typical features.
4. Nucleic acids, structure and functions in the cell. Mechanism of DNA replication.
5. Morphological structure of metaphase chromosome. Types of chromosomes. Human karyotype.
6. Genetic code and its properties.
7. Protein biosynthesis as the process of realization of biological information in the cell.
8. Mitotic cycle, its division into periods. Interphase, its stages and their biological role.
9. Characteristics of mitotic stages. Significance of mitosis.
10. Meiosis and its mechanisms. Biological role of meiosis.
11. Gametogenesis, its biological significance. Spermatogenesis.
12. Morphological features of spermatozoa and ova. Types of ova.
13. Cleavage, types. Blastula.
14. Gastrulation, types.
15. Neurulation. Histo- and organogenesis.
16. Provisory organs of vertebrate embryos.
17. Monohybrid cross. The principles of Uniformity (Dominance) and Segregation.
18. Di- and polyhybrid cross. The principle of independent assortment.
19. The role of chromosomes in determination of sex. Sex-linked inheritance.
20. Phenomenon of linkage. Complete and incomplete linkage.
21. The main states of the chromosome theory of inheritance.
22. Interaction of allelic genes. Complete dominance. Incomplete dominance. Codominance.
23. The inheritance of blood groups of ABO system in human.
24. Interaction of non-allelic genes.
25. Modificational variability, its significance in ontogenesis.
26. Combinative variability: mechanisms and significance.
27. Mutational variability. Gene mutations.
28. Mutational variability. Chromosome mutations.
29. Mutational variability. Genome mutations.
30. The main methods in human genetics.
31. Amebic dysentery: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis,laboratory diagnosis and prevention of amebiasis.
32. Balantidiasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratorydiagnosis and prevention of balantidiasis.
33. Giardiasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratorydiagnosis and prevention of giardiasis.
34. Malaria parasites: latin names, morphology, life cycle. Symptoms, pathogenesis, laboratorydiagnosis and prevention of malaria.
35. American trypanosomiasis: latin name of parasite, morphology, life cycle. Symptoms,pathogenesis, laboratory diagnosis and prevention of trypanosomiasis.
36. Toxoplasmosis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis,laboratory diagnosis and prevention of toxoplasmosis.
37. Vaginal trichomoniasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis,laboratory diagnosis and prevention of trichomoniasis.
38. African trypanosomiasis: latin name of parasite, morphology, life cycle. Symptoms,pathogenesis, laboratory diagnosis and prevention of trypanosomiasis.
39. Visceral leishmaniasis: latin name of parasite morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of leishmaniasis.
40. Lymphatic filariasis: latin names of parasites, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of filariasis.

41. Trichinellosis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichinellosis.
42. Lung fluke: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of paragonimiasis.
43. Dwarf tapeworm: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of hymenolepiasis.
44. Ascariasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of ascariasis.
45. Lice: latin name of human lice, morphology, life cycle. Medical importance, prevention of the infestation.
46. Pork tapeworm and beef tapeworm: latin names, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of taeniasis and cysticercosis.
47. Pinworm: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of enterobiasis.
48. Whipworm: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichuriasis.
49. Dwarf tapeworm: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of hymenolepiasis.
50. Hookworms: latin names, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of ancylostomiasis (necatoriasis).
51. Echinococcosis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of echinococcosis.
52. Ixodid ticks: morphology, life cycle. Medical importance, prevention of the infestation.
53. Medical importance of mosquitoes and prevention of the infestation. Differences between Culex and Anopheles mosquitoes.
54. Itch mite: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of scabies.
55. Blood flukes: latin names, morphology, life cycle.
56. Guinea worm: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of dracunculiasis.
57. Argasid ticks: morphology, life cycle. Medical importance, prevention of the infestation.
58. Vaginal trichomoniasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichomoniasis.
59. Vaginal trichomoniasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trichomoniasis.
60. African trypanosomiasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of trypanosomiasis.
61. Argasid ticks: morphology, life cycle. Medical importance, prevention of the infestation.
62. Cutaneous leishmaniasis: latin name of parasite, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of leishmaniasis.
63. Fish tapeworm: latin name, morphology, life cycle. Symptoms, pathogenesis, laboratory diagnosis and prevention of diphyllobothriasis.
64. Fleas: latin name of human flea, morphology, life cycle. Medical importance, prevention of the infestation.

Federal State Budget Educational Institution of Higher Education "North Ossetian State Medical Academy" of the Ministry of Health of the Russian Federation

Department of Biology and Histology

COLLECTIONS OF PROBLEMS/PRACTICAL TASKS

«Biology»

the main professional educational program of higher education - specialty program in the specialty 31.05.03 Dentistry

For the first year students who study in English

Contents

Cell biology

1. The strand of DNA molecule has the following sequence of nucleotides: 3'TATGTTGAACTTCGAAAG5'. Determine the sequence of nucleotides in the second strand of DNA.

2. The strand of DNA molecule has the following sequence of nucleotides: 3'TCATGTTTGAACACGAATAG5'. Determine the sequence of nucleotides in the second strand of DNA.

3. The strand of DNA molecule has the following sequence of nucleotides: 3'CCGTATGTATGAGACTTCCGAATAG5'. Determine the sequence of nucleotides in the second strand of DNA.

4. The double helix of DNA has 22% of nucleotides with adenine (A). Determine the percentage of guanine (G), cytosine (C) and thymine (T) in this molecule.

5. The double helix of DNA has 32% of nucleotides with thymine (T). Determine the percentage of guanine (G), cytosine (C) and adenine (A) in this molecule.

6. The double helix of DNA has 46 nucleotides with cytosine (C), that is 22% of all nucleotides. Determine the number of guanine (G), adenine (A) and thymine (T) in this molecule.

7. The double helix of DNA has 38 nucleotides with guanine (G), that is 24% of all nucleotides. Determine the number of cytosine (C), adenine (A) and thymine (T) in this molecule.

1. The strand of DNA molecule has the following sequence of nucleotides: 3'TATGTTGAACTTCGAAAGTAA5'. Determine the structure of protein molecule, encoding this region of DNA molecule.

2. The hormone of pancreas, glucagon, consists of 29-th amino acids. The first 8 amino acids have the following sequence: his - ser - glu - gly - thr - phe - thr - ser. Determine the sequence of nucleotides in DNA molecule.

3. What is the molecular mass of gene, if one strand of DNA molecule encodes the polypeptide molecule with molecular mass 1500? Molecular mass of one amino acid is 100, molecular mass of one nucleotide is 345.

4. Complete the table, reading from the left to the right.

C												**DNA double helix**
							G	A				
	C	A				U						**m-RNA**
									G	G	A	**t-RNA**
			Trp									**Protein**

5. Complete the table, reading from the left to the right.

A						T						**DNA double helix**
		C					A				A	
	G							C	G			**m-RNA**
										G		**t-RNA**
			Met									**Protein**

6. Complete the table, reading from the left to the right.

						A					T	**DNA double helix**
T									G			
		C					U			A		**m-RNA**
	G							U				**t-RNA**
			Trp									**Protein**

7.
A fragment of a gene has the following sequence of nucleotides:
DNA: 5’ -A-T-T-G-G-G-T-T-C-G-C-A-T-G-C-G-T-T-A-C-3’
DNA: 3’ -T-A-A-C-C-C-A-G-C-G-T-A-C-G-C-A-A-T-G-5’

The gene contains informative and uninformative parts for translation. The informative part of the gene begins with a triplet encoding the amino acid Met. Determine the sequence of amino acids in the fragment of the polypeptide chain.

8.
tRNA molecules carrying the anticodons enter the ribosome in the following order:
anticodon tRNA: 5’ACU3’, 5’GGU3’, 5’UGA3’, 5’GAU3’.
Determine the sequence of nucleotides of the DNA chains, and RNA and amino acids in the molecule of the synthesized protein fragment.

9.
A fragment of the gene has the following sequence of nucleotides:
DNA: 5’ -C-A-G-A-G-G-A-G-A-C-A-A-A-C-3’
DNA: 3’ -G- T-C-T-C-C-T-C-T-G-T-T-T-G 5’
Establish the nucleotide sequence of the tRNA that is synthesized on this fragment, designate the 5’ and 3’ ends of this fragment and determine the amino acid that this tRNA will carry during protein biosynthesis if the third triplet from the 5’ end is the anti-codon of tRNA.

10.
A part of a DNA molecule consists of 60 pairs of nucleotides. Determine the length of this part (the distance between nucleotides in DNA is 0.34 nm)

11. A part protein consist of 100 amino acids. Determine the length of part gene (the distance between nucleotides in DNA is 0.34 nm)

12.
Studies have shown that the mRNA contains 34% guanine, 18% uracil, 28% cytosine and 20% adenine. Determine the percentage of nitrogenous bases in the DNA region that is the template for this mRNA.

13.
In one research laboratory, a portion of one of the chains of the deoxyribonucleic acid (DNA) molecule was studied. It turned out that it consists of 24 monomers-nucleotides: 5’TCTTAACGTACGTTGTCAG3 ’. What is the structure of the corresponding section of the second chain of the same DNA molecule?

14.
The DNA molecule is 1100 nucleotides with adenine, which is 10% of their total number. Determine how many nucleotides with thymine (T), guanine (G), cytosine (C) are contained separately in the DNA molecule.

15
The DNA molecule is split into two chains. One of them has the structure: 3’TACTCATGGTCAGTGCT5’’. What will be the structure of the second DNA molecule, when the specified chain will reach the full double-stranded molecule?

16
The region of one of the two chains of the DNA molecule contains 300 nucleotides with adenine (A), 100 nucleotides with thymine (T), 150 nucleotides with guanine (D) and 200 nucleotides with cytosine (C). What is the number of nucleotides with A, T, G and C contained in the double-stranded DNA molecule?

17
One of the strands of the DNA molecule has the following sequence of nucleotides 3'CCCTAAGGTCGTAGCGCTA5 ’. What sequence of nucleotides does the second chain of the same molecule have?

18
The DNA molecule segment (one chain) contains 150 nucleotides with adenine (A), 50 - with thymine (T), 300 - with cytosine (C) and 100 - with guanine (G). Determine the total number of nucleotides with A, T, C and D in the two chains of this region of the DNA molecule.

19
The region of the DNA molecule has the structure: 5’ATCGTCGATGCGTACGTACGTAGAGTC3 ’. Determine the structure of the second DNA strand, the nucleotide composition and the number of triple hydrogen bonds in this region of the DNA molecule.

20
One DNA molecule contains 30 nucleotides with thymine (T), which is 10% of the total number of nucleotides. Determine the number of (absolute) nucleotides with adenine, guanine and cytosine in this DNA molecule.

21

The molecular mass of the protein is 50,000. Determine the length of its gene, if it is known that the mass of one amino acid is about 100, and the distance between two nucleotides in the DNA chain is 3.4 angstroms.

22

The DNA chain fragment has the sequence of nucleotides:

5’ AAAGGTTCCACCTTAACG 3 ’ Determine the nucleotide sequence on mRNA and the amino acid sequence of the encoded protein using the table of the genetic code.

23

The molecular mass of the protein is 45,000. Determine the mass of the its gene, if it is known that the molecular weight of one amino acid is about 100, and the mass of one nucleotide is about 300.

24

A fragment of one of the DNA chains has the following structure: 5’TCGGCTCCGAGATCGAAG3’. Build m-RNA and determine the sequence of amino acids in a fragment of the protein molecule (for this, use the table of the genetic code).

25

Determine the mass of the DNA molecule if 100 proteins are encoded in its coding chain. It is known that the average number of amino acids in one protein is 20, and the mass of one nucleotide is 300.

26

The DNA chain fragment has the sequence of nucleotides: 5’CGAGGTTCCACCTTAACG3 ’. Determine the nucleotide sequence on mRNA and the amino acid sequence of the protein molecule fragment using the table of the genetic code.

27

m-RNA consist of: A - 10%, G - 30%, C - 40%, U - 20%. Determine the percentage of nucleotides in the region of the double-stranded DNA molecule, which is the template for this RNA.

28

A fragment of one of the DNA chains has the following structure: 5’GGAGCTCCGAGATCGAAG3’. Build m-RNA and determine the sequence of amino acids in a fragment of the protein molecule (for this, use the table of the genetic code).

29

The molecular mass of the gene (both DNA strands) is 72,000,000. Find the mass of the protein encoded in this gene, if it is known that the mass of one nucleotide is about 300, and the mass of one amino acid is about 110.

30

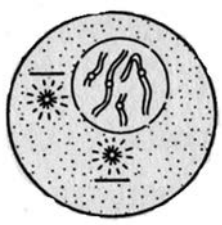
The DNA chain fragment has the sequence of nucleotides: 5’ATTGGTTCCACCTTAACG3 ’. Determine the nucleotide sequence on mRNA and the corresponding amino acid sequence of the protein molecule fragment using the table of the genetic code.

31

A fragment of one of the DNA chains has the following structure: 5’ATCTCTAGGGAGATCGAG3’. Build m-RNA and determine the sequence of amino acids in a fragment of the protein molecule (for this, use the table of the genetic code).

32

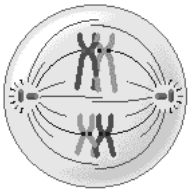
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

33

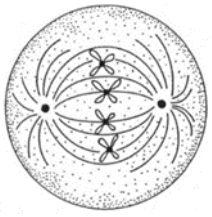
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

34

For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

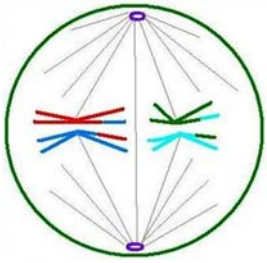
35

For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

36

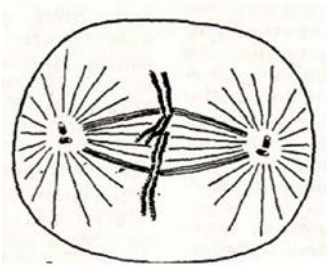
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

37

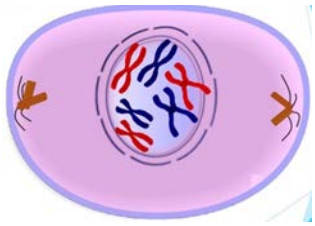
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

38

For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

39

For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

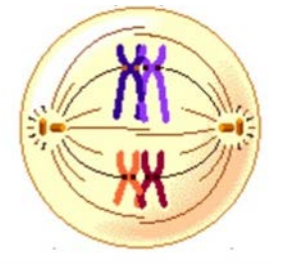
40

For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

41

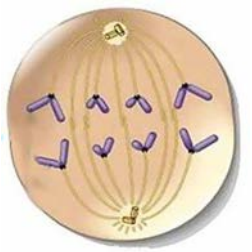
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

42

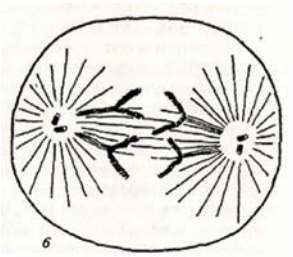
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

43

For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

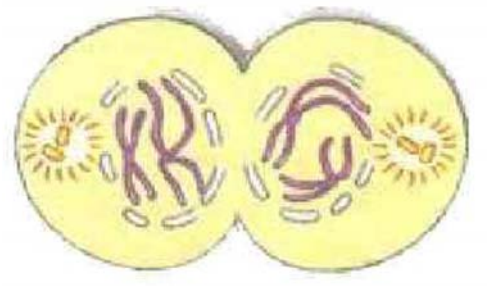
44

For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

45

For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

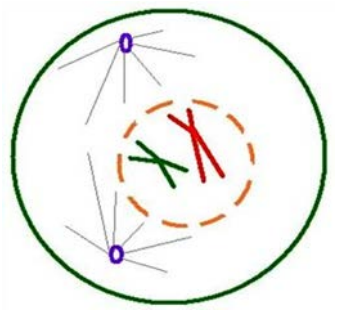
46

For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

47

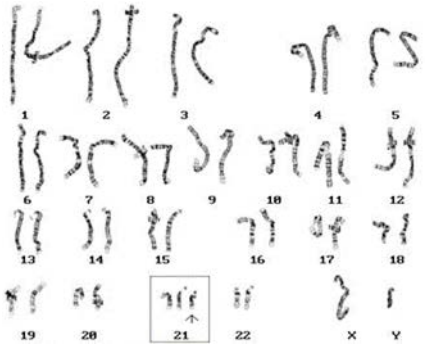
For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

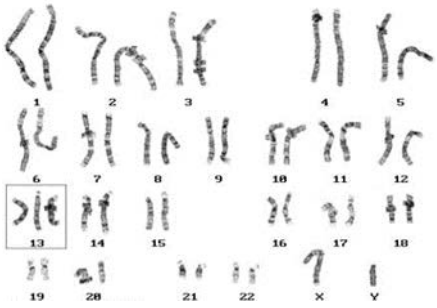
48

Determine what kind of mutation is shown in the figure, make a diagnosis. Write the karyotype.



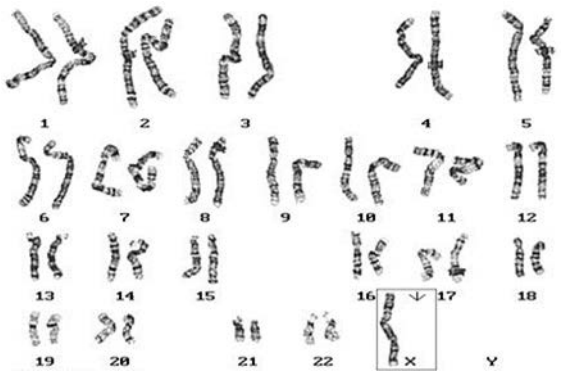
49

Determine what kind of mutation is shown in the figure, make a diagnosis. Write the karyotype.



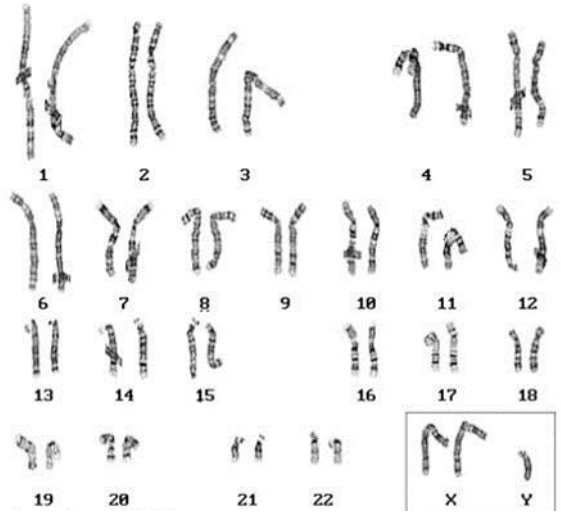
50

Determine what kind of mutation is shown in the figure, make a diagnosis. Write the karyotype.



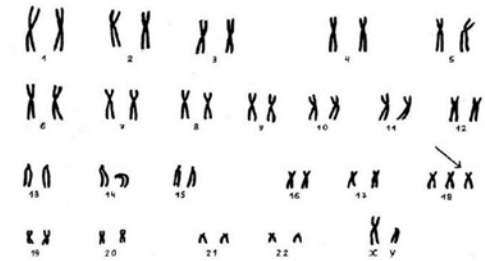
51

Determine what kind of mutation is shown in the figure, make a diagnosis. Write the karyotype.



52

Determine what kind of mutation is shown in the figure, make a diagnosis. Write the karyotype.

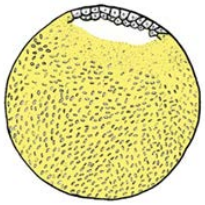


Ontogenesis. General patterns of embryonic development. Regulation of ontogenesis.

1. Answer the questions about the picture

What type of blastula is shown in the picture?	
What type of cleavage provides the formation of this blastula?	
What type of egg is characteristic of animals with this type of cleavage? a) amount of yolk	a)
b) distribution of yolk	b)

2. Answer the questions about the picture

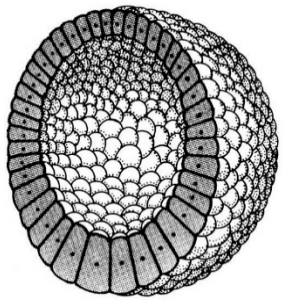


What type of blastula is shown in the picture?	
What type of cleavage provides the formation of this blastula?	
What type of egg is characteristic of animals with this type of cleavage? a) amount of yolk	a)
b) distribution of yolk	b)

3. Answer the questions about the picture

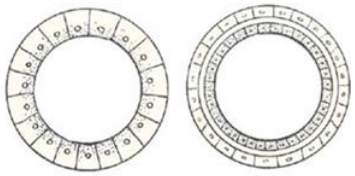
What type of blastula is shown in the picture?	
What type of cleavage provides the formation of this blastula?	
What type of egg is characteristic of animals with this type of cleavage? a) amount of yolk	a)
b) distribution of yolk	b)

4. Answer the questions about the picture

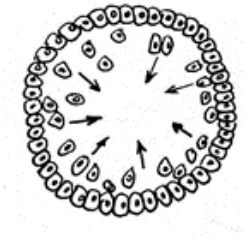


What type of blastula is shown in the picture?	
What type of cleavage provides the formation of this blastula?	
What type of egg is characteristic of animals with this type of cleavage? a) amount of yolk	a)
b) distribution of yolk	b)

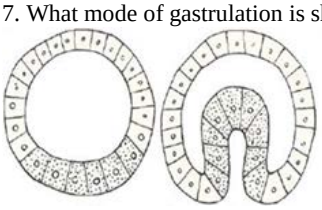
5. What mode of gastrulation is shown in the picture? Describe this process.



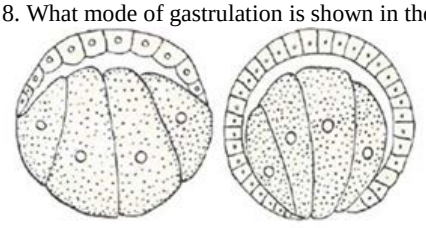
6. What mode of gastrulation is shown in the picture? Describe this process.



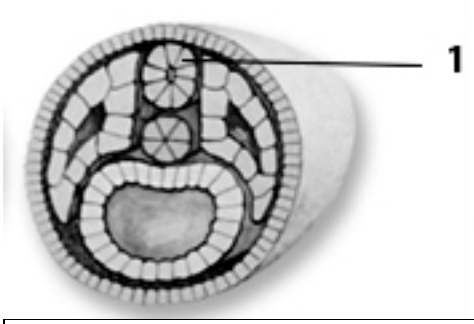
7. What mode of gastrulation is shown in the picture? Describe this process.



8. What mode of gastrulation is shown in the picture? Describe this process.

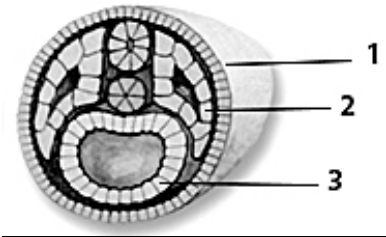


9. Answer the questions about the picture



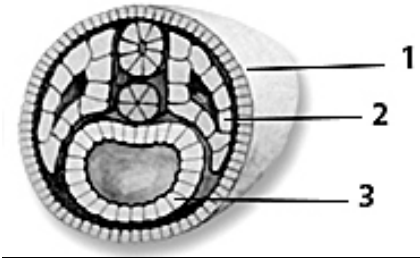
Name the embryonic stage shown in the figure	
What is indicated in figure by number 1?	
Which germ layer gives rise to this structure?	

10. Answer the questions about the picture



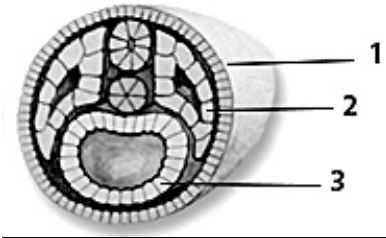
Name the process that leads to the formation of the embrionic stage shown in the figure	
Which germ layer is indicated in figure by number 3?	
Which organs this germ layer give rise to?	

11. Answer the questions about the picture



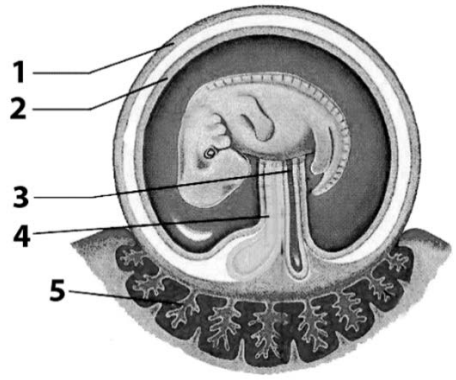
Name the embryonic stage shown in the figure	
Which germ layer is indicated in figure by number 1?	
Which organs this germ layer give rise to?	

12. Answer the questions about the picture

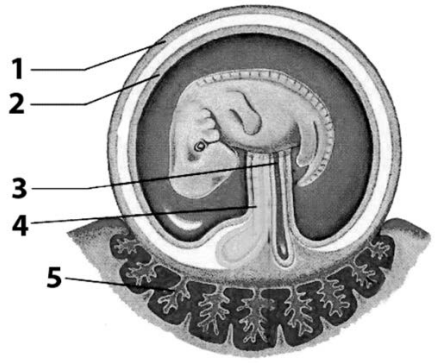


Name the embrionic stage shown in the figure	
Which germ layer is indicated in figure by number 2?	
Which organs this germ layer give rise to?	

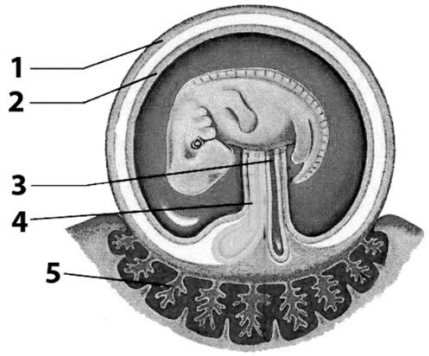
13. Which extraembryonic organ is indicated in figure by number 1? Which germ layers form this organ? What are the functions of this organ?



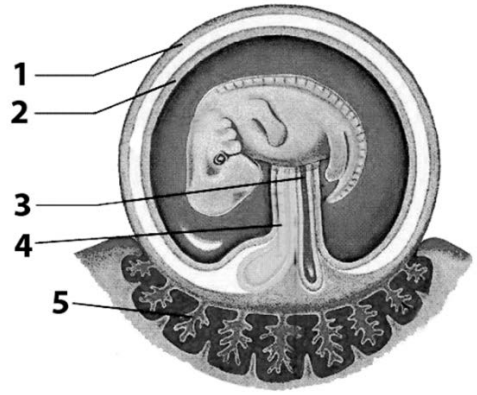
14. Which extraembryonic organ is indicated in figure by number 2? Which germ layers form this organ? What are the functions of this organ?



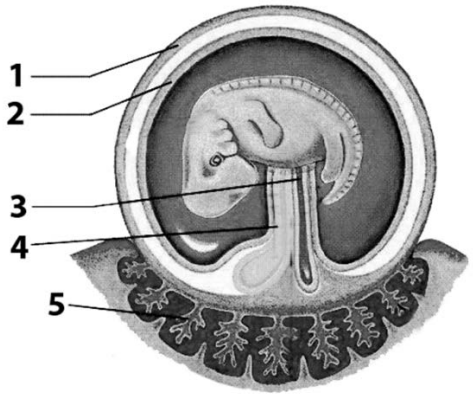
15. Which extraembryonic organ is indicated in figure by number 3? Which germ layers form this organ? What are the functions of this organ?



16. Which extraembryonic organ is indicated in figure by number 4? Which germ layers form this organ? What are the functions of this organ?



17. Which extraembryonic organ is indicated in figure by number 5? Which germ layers form this organ? What are the functions of this organ?



Medical genetic. Monogenic and polygenic inheritance. Entangled inheritance. Sex-Linked Genetics. Regularities and mechanisms of variability.

Problem 1. In human being the gene of brown colour of eyes dominates over gene of blue colour of eyes. Determine the phenotypes of children in the family, in which the father has blue colour of eyes and the mother has brown color of eyes (her father was blue-eyed and mother - brown-eyed).

Problem 2. In human being right hand-writing dominates over left hand-writing. In the family the both parents have right hand-writing and are heterozygotes for the gene of hand-writing. Determine the children phenotypes in this family.

Problem 3. Polydactyly is inherited as an autosome dominant character. Determine the probability of the birth of a child with extra fingers in the family, in which the mother has normal structure of hand and the father is heterozygous for the gene of polydactyly.

Problem 4. Phenylketonuria (PKU) is inherited as an autosome recessive disease. In the family, in which both parents were healthy there were born dizygotic twins - the girl with PKU and healthy boy. Determine the parental genotypes and the probability of the birth of the next healthy child in this family.

Problem 5. In human, the albinism is inherited as an autosome recessive character. In the family, in which both parents were healthy there was born albino son. Determine the probability of birth of the next child without anomaly.

Problem 6. The cataract in human is an autosome dominant disease. Woman, whose mother had cataract, got married to healthy man. Determine the probability of the birth of healthy children in this family, if it was known, that woman received anomaly from her mother.

Problem 7. The positive Rh-factor is an autosome dominant character. The woman with Rh-positive factor got married to the man with negative Rh-factor. There were born the boy with Rh-negative factor and the girl with Rh-positive factor. Determine the parental genotypes and the probability of the birth of the next children with Rh-positive factor.

Problem 8. Some forms of deafness and dumbness are inherited as autosome recessive characters. In the family, where both parents had good ear there was born the deaf-and-dumb child. Determine the parental genotypes and the probability of the birth of a child with good ear in this family.

Problem 9. Albinism is recessive to normal body pigmentation in man. It is an autosomal trait. If a homozygous normal man marries an albino girl, what would be the phenotypic and genotypic ratios in offspring of their daughter, if she'll marry man with same genotype?

Problem 10. Albinism, the total lack of pigment is due to a recessive gene. A man and woman plan to marry and wish to know the probability of their having an albino child. What advice would you give to them if…

(a) Both are normally pigmented, but each has one albino parent.

(b) The man is an albino, and woman is heterozygous.

(c) The man is an albino and woman's family includes no albino for at least three generations.

Problem 11. A brown eyed man marries a blue eyed woman and they have eight children, all brown eyed. What are the genotypes of all the individuals in the family?

Problem 12. A blue eyed man, whose both parents were brown eyed, marries a brown-eyed woman. They had one child, who is blue eyed. What are the genotypes of all the individuals in problem mentioned above?

Problem 13. A woman has a rare abnormality of the eyelids called ptosis, which makes it impossible for her to open her eyes completely. The condition has been found to depend on a single dominant gene. The woman's father had ptosis, but her mother had normal eyelids. Her father's mother had normal eyelids. What are the probable genotypes of the woman, her father and mother? What proportion of her children will be expected to have ptosis if she marries a man with normal eyelids?

Problem 14. A woman is Rh positive and both of her parents are Rh positive. She marries an Rh negative man. Is there any chance that they may have any Rh negative children? Explain.

Problem 15. A woman bears a child with erythroblastosis at her second delivery. She has never had a blood transfusion. On the basis of this data, classify the woman, her husband and both children as to Rh type.

Problem 16. Hypoplasia of enamel is inherited as X-linked dominant character. In the family, in which both parents had disease there was born son with healthy teeth. What are the possible phenotypes of their second son?

Problem 17. Classical hemophilia is inherited as recessive X-linked disease. Man with hemophilia marries heterozygous healthy woman. In this family were born healthy children. What is the probability of the birth of the sick children in this family?

Problem 18. The gene of daltonism (color blindness) is located in X chromosome and is inherited as a recessive character. Woman with normal sight, whose father had daltonism, got married to healthy man, whose father had daltonism. Determine the phenotypes of children in this family.

Problem 19. A colour blind man marries a woman with normal vision. Her mother was colour blind. What kind of children would you expect from this marriage?

Problem 20. A woman with normal vision marries a man with normal vision and they have a colour blind son. Her husband dies and she marries a colour blind man. Show the type of children that might be expected from the second marriage and the proportions of each.

Problem 21. A man has hypertrichosis of the ears, a condition which is due to a gene on the non– homologous portion of the Y chromosome (hollandria). He marries a normal woman. Show the types of children they may expect.

Problem 22. Suppose a young lady comes to you for advice in your capacity as a marriage counselor. She tells you her brother has hemophilia, but both of her parents are normal. She wishes to marry a man who has no history of hemophilia in his family. She would like to know the probability of having hemophilic offspring. Explain.

Problem 23. Anhydrotic ectodermic dysplasia is inherited as a recessive X-linked disease. Healthy woman gets married to the sick man. In this family there were born sick daughter and healthy son. Determine the probability of the birth of the next child without disease.

Problem 24. When a baemophilic male is mated with a heterozygous baemophilic female, what baemophilic proportion will be resulted in each sex?

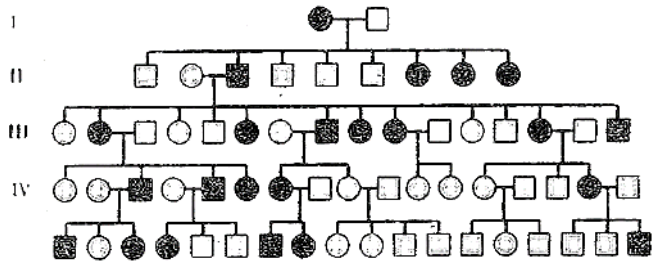
Problem 25. When a haemophilic male is mated with a homozygous non-baemophilic female—What will be the result?

Problem 26. Of what type will be the children with reference to colour blindness, when a woman is colour-blind and her husband is normal?

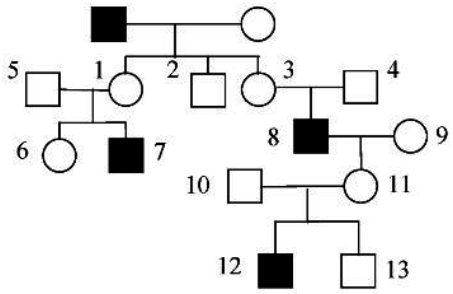
Problem 27. When both the parents are colour-blind, can they produce a normal daughter?

Problem 28. In a cross between a white-eyed female fruit fly and red-eyed male, what percent of the female offspring will have white eyes? (White eyes are X-linked, recessive)

Problem 29. Analyze the Pedigree. Determine the type of trait inheritance



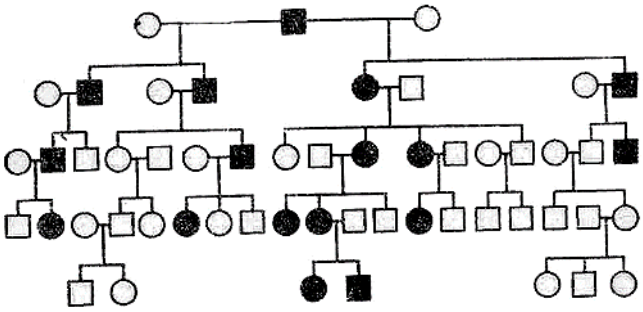
Problem 30. Analyze the Pedigree.



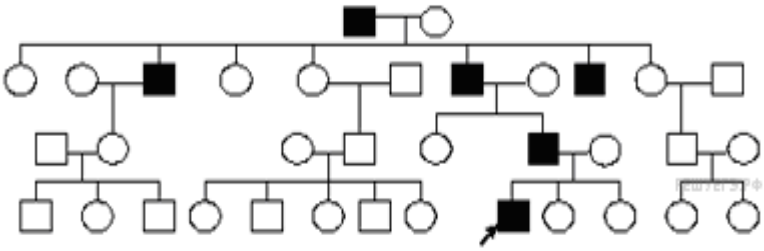
1) What is the most likely mode of inheritance for this pedigree?

2) State the genotypes of individuals №1-13 in the following table

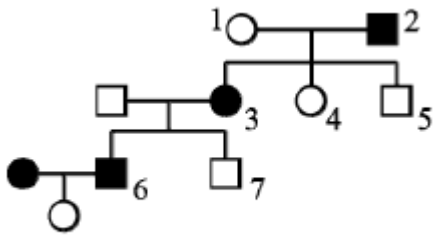
Problem 31. Analyze the Pedigree. What is the most likely mode of inheritance for this pedigree?



Problem 32. Analyze the Pedigree. What is the most likely mode of inheritance for this pedigree?



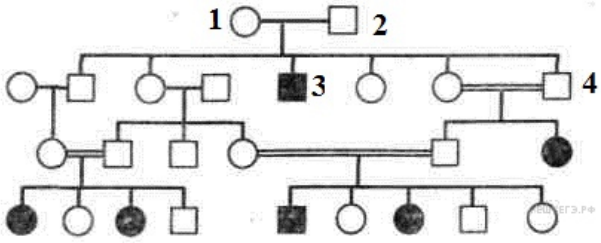
Problem 33. Analyze the Pedigree.



1) What is the most likely mode of inheritance for this pedigree?

2) State the genotypes of individuals №1-6 in the following table

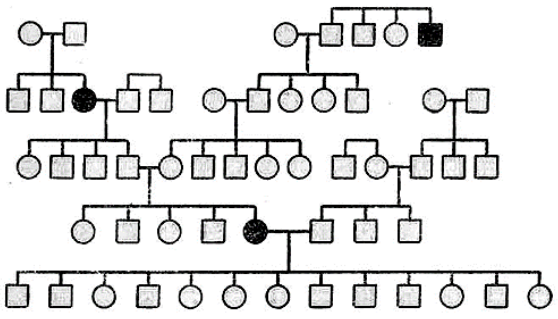
Problem 34. Analyze the Pedigree.



1) What is the most likely mode of inheritance for this pedigree?

2) State the genotypes of individuals №1-4 in the following table

Problem 35. Analyze the Pedigree. What is the most likely mode of inheritance for this pedigree?



Problem 36.

Draw and analyze the Pedigree

Two normally-pigmented parents have 3 children. The first child (a girl) and their second child (a boy) have normal pigmentation. Their third child (a girl) has albinism. That girl marries a normally pigmented male and they have four children. The first three (two girls and a boy) have normal pigmentation. Their fourth child (a girl) has albinism like her mother. Determine the type of trait inheritance

Problem 37. In the family, where both parents have normal vision, there is the son with daltonism and two daughters with normal vision. The son has the own son with normal vision. The children of the first daughter are the son with daltonism and the daughter with normal sight. The second daughter has five healthy sons. Draw the pedigree of this family. Determine the probability of the birth of healthy sons in the family of first daughter.

Problem 38. The proband is sick man with night blindness. There are no sick persons in the paternal line. The mother of proband is sick. Two sisters and two brothers of proband's mother are healthy. They have only healthy children. There is sick grandmother, healthy grandfather in the maternal line. The sister of grandmother is sick and her brother is healthy. It is known that the great-grandfather (the grandmother's father) was sick and his sister and brother were sick too. The great-great-grand father was sick, his brother, who had the sick daughter and son, was sick too. The proband's wife and her relatives were healthy. Determine the probability of the birth of sick children in this family.

Problem 39. Two sisters Mary and Margo with polydactily got married to the men with normal structure of hand. In the family of sister Margo, there were 5 children, three of them Igor, Kate, David have normal structure of hand, and tho, Ella, Richard are polydactyl. In family of sister Mary there was one daughter Diana with normal structure of hand. Igor had polydactyl daughter in the first marriage with healthy woman, and six children in the second marriage with healthy woman too. There are two daughters and one son with normal structure of hand and two sons and one daughter with polydactily among six children of Igor. Ella got married to the healthy man. They have two sons and four daughters, all of them are healthy. David got married to the healthy woman, their one son was polydactyl. Richard got married to his cousin Diana, all their children – two daughters and three sons were healthy. Draw the pedigree of this family and determine the probability of the birth of healthy children in Kate's family, if her husband is polydactyl (his father had normal structure of hand).

Problem 40. Polydactyly and myopia are inherited as autosome dominant characters. Determine the possible genotypes and phenotypes of the children in the family, in which the mother is healthy and the father has both anomalies and is diheterozygote.

Problem 41. Brown colour of eyes dominates over blue colour of eyes. Blue-eyed woman got married to the brown-eyed man. Their first child has blue colour of eyes and phenylketonuria. Phenylketonuria is autosome recessive disease. Determine the parental genotypes and the probability of the birth of healthy child in this family.

Problem 42. In summer squash, white fruit color (W) is dominant over yellow fruit color (w) and disk-shaped fruit (D) is dominant over sphere-shaped fruit (d).. If a squash plant with yellow disk-shaped fruit is crossed with a plant with white sphere-shaped fruit, what will the phenotypic and genotypic ratios be for F1 generation if it is known, that some offspring has yellow and sphere-shaped fruit?

Problem 43. Hemophilia is an X-linked recessive condition in which blood does not clot properly. A blue eyed healthy man, marries a brown-eyed healthy woman. They had one child, who has blue eyes and hemophilia. Woman is pregnant with a second child. What is the probability of birth of child a child like first one?

Problem 44. In mice, the ability to run normally is a dominant trait. Mice with this trait are called running mice (R). The recessive trait causes mice to run in circles only. Mice with this trait are called waltzing mice (r). Hair color is also inherited in mice. Black hair (B) is dominant over brown hair (b). Cross a homozygous running, heterozygous black mouse with a waltzing brown mouse. What will the phenotypic and genotypic ratios be for F1 generation

Problem 45. A woman is Rh positive and healthy. She marries an Rh negative colorblind man (gene of daltonism is located in X chromosome and is inherited as a recessive character). Is there any chance that they may have any Rh negative colorblind children?

Problem 46. In humans, nearsightedness (N) is dominant to normal vision (n), and polydactyly (P) (having more than 5 fingers) is dominant to 5-fingered hands (p). A man has normal vision and is heterozygous for polydactyly; a woman is heterozygous for nearsightedness and has normal hands. If they marry, what is the probability of this couple having a child with normal vision and normal hands?

Problem 47. Albinism is due to a recessive autosomal gene. Hemophilia is an X-linked recessive condition. A man and woman plan to marry and wish to know the probability of their having an albino child with hemophilia. What advice would you give to them if woman is healthy (but her father is albino and suffer from hemophilia), and man is albino, but with normal blood clotting.

Problem 48. Jenny has red hair and freckles. We know that non-red hair (R) is dominant to red hair (r), and that freckles (F) are dominant to plain skin (f). She tells you that her mom has brown hair and freckles, and that her dad has red hair and plain skin. Furthermore, she says that her maternal grandmother (her mom's mom) had red hair and plain skin. Jenny's mom is pregnant with a second child. What is the probability that Jenny will have a brother or sister with brown hair and plain skin?

Problem 49. Hypoplasia of enamel is inherited as X-linked dominant character. In the family, in which both parents had disease and brown eyes there was born son with healthy teeth and blue eyes. What are the possible phenotypes of their second son?

Problem 50 Polydactyly (extra fingers) is inherited as an autosome dominant character, fructosuria - as a recessive character. In the family, in which the man had polydactyly and the woman was healthy, there was born a child with normal structure of hand and fructosuria. Determine the parental genotypes and the probability of the birth of a healthy child in this family.

Problem 51. In man brown eyes (B) are dominant to blue (b) and dark hair (R) are dominant to red hair (r). A man with brown eyes and red hair marries a woman with blue eye and dark hair. They have two children, of whom one has brown eyes and red hair. Give the genotypes of the parents and children.

Problem 52. In Drosophila, vestigial wings and ebony colour are due to two separate recessive genes. The dominant alleles are normal (long) wings and normal (gray) body colour.

1) What type of offspring would you expect from a cross between a bomozygous vestigial ebony female and a normal double homozygous (long–winged, gray–bodied) male?

2) If the F1 are allowed to breed among themselves what types of offspring would you expect in the F2? Show complete genotype and phenotype of both generations.

3) If you made a test cross of the F1 males of the preceding problem what results would you expect to obtain?

Problem 53. About 75% of Americans get a bitter taste from a chemical called phenyl thiocarbamide (PTC); the others do not. A normally pigmented woman who is non–taster has a father who is an albino–taster. She marries an albino man who is a taster, but who has a mother who is non–taster. Show the types of children which this couple may have.

Problem 54. In tomatoes, yellow fruit and dwarfed vine are due to recessive alleles of genes which produce the more common red fruit and tall vine. If pollen from the pure–line dwarf plant bearing red fruit is placed on the pistil of a pure–line tall plant bearing yellow fruit, what type of plant and fruit would be expected in the F1? If these are crossed among themselves, what results would be expected in the F2?

Problem 55 Some dogs bark while trailing, others are silent. The barking trait is due to a dominant gene. Erect ears are dominant to drooping ears. What kind of pups would be expected from a double heterozygous erect–eared, barker mated to a drooped–eared, silent trailer?

Problem 56. In pigeons, the checkered pattern is dependent on a dominant gene A and plain on the recessive allele a. Red colour is controlled by a dominant gene B and brown by the recessive allele b. Diagram completely a cross between homozygous checkered, red and plain, brown birds. Summarize the expected F2 results.

Problem 57. A checkered–brown female mated with a plain–red male produced 2 checkered–red, 2 plain–red, and 1 checkered–brown offspring. Give the probable genotypes of the parents.

Problem 58. Cataract and polydactily in human are autosome dominant characters. The genes are in the same chromosome and show the complete linkage (there is no cross-over). Woman received the cataract from her mother and polydactily – from her father. Her husband is healthy for both diseases. Determine the probability of the birth of healthy children in this family.

Problem 59. The genes determining Rh-factor and erythrocytes shape are in the same chromosome and the distance between them is 3 morganids. Woman received both dominant genes: Rh+ and oblong erythrocyte shape from her father and both recessive genes (Rh- and normal erythrocyte) - from her mother. Her husband had Rh- gene and the gene of normal shape of erythrocytes. Determine the probability of the birth of a child with oblong shape of erythrocyte and Rh- negative factor.

Problem 60. It is known that genes A and B located in one chromosome, and the distance between them is 10cM. Determine the ratio of the percentage of gametes that are formed in diheterozygous organism.

Problem 61. In drosophila flies genes that determine the color of body and form of wings located in one chromosome. The female parent is brown and wingless and the male parent is black with normal wings. All of the flies in the F1 generation are brown and have normal wings. When you count the F2 generation (after testcross of female F1), you get: 85 brown winged flies, 728 black winged flies, 712 brown wingless flies and 75 black wingless flies. What is the genetic distance between the color and wing genes?

Problem 62. It is known that genes D and E located in one chromosome, and the distance between them is 20cM. Determine the ratio of the percentage of gametes that are formed in diheterozygous organism.

Problem 63. In flies the red body phenotype is dominant to the yellow body phenotype and smooth wings are dominant to crinkled. Both of genes located in one chromosome. The distance between these genes is 30cM. You cross a true-breeding yellow-bodied smooth-winged female with a true-breeding red-bodied crinklewinged male. What will be the phenotype(s) and ratio of the F2 progeny after testcross of female F1?

Problem 64. It is known that genes B and d located in one chromosome, and the distance between them is 30cM. Determine the ratio of the percentage of gametes that are formed in diheterozygous organism.

Problem 65. In tomato genes that determine the height of the plants - T (tall) and t (dwarf) and the shape of the fruit - S (round) and s (pear-shaped), located in one chromosome, ie they are linked. As a result of test cross of diheterozygous plant, was obtained in the offspring 40 tall plants with round fruits, 40 dwarf plants with pear-shaped fruits, 10 tall plants with pear-shaped fruits, and 10 dwarf plants with round fruits. Determine the genetic distance between genes

Problem 66. It is known that genes A and d located in one chromosome, and the distance between them is 40cM. Determine the ratio of the percentage of gametes that are formed in diheterozygous organism.

Problem 67. In maize genes that determine the color of seedlings - Green (dominant) and yellow (recessive) and brightness of the color of leaves - Opaque (dominant) and brigh (recessive), located in one chromosome. All plants from crosses of pure lines of maize have a Green seedlings and Opaque leaves. As a result of test cross, obtained in the progeny 240 plants with Green seedlings and Opaque leaves, 220 plants with yellow seedlings and brigh leaves, 36 plants with Green seedlings and brigh leaves, and 24 plants with yellow seedlings and Opaque leaves. Determine the genetic distance between genes.

Problem 68. You cross a true-breeding yellow-bodied, smooth-winged female fly with a true-breeding red-bodied, crinkle-winged male. The red body phenotype is dominant to the yellow body phenotype and smooth wings are dominant to crinkled wings. You perform a dihybrid test cross between the F1 flies with a true-breeding yellow-bodied, crinkle-winged fly. The following F2 results are detected: red body and smooth wings - 102; yellow body and smooth wings - 404; red body and crinkled wings - 396; yellow body and crinkled wings - 98. Determine the recombination frequency (%) between the body color and wing surface genes.

Problem 69. One of autosome gene controls wing length in flies. This gene has two alleles, "L or l" where long wings are dominant to short wings. The other autosome gene controls body colour. Red body phenotype is dominant to the yellow body phenotype. Red-bodied, short wing male with yellow-bodied, long wing female. All F1 are red-bodied, long wing. After test cross between the F1 flies above with yellow-bodied, short-winged flies, you get the following F2 results: red body and long wings – 45; red body and short wings – 460; yellow body and long wings - 440; yellow body and short wings – 55. What is the recombination frequency (%) between the genes for body color and wing length?

Problem 70. Myasthenia and Protanopia are inherited as recessive X-linked diseases. The distance between genes is the 10 centimorgans. Healthy woman (her father had myasthenia and her mother had protanopia) gets married to the healthy man. What are the phenotypes of their children?

Problem 71. Acatalasia is inherited as autosome incomplete recessive character. The heterozygotes have the reduced activity of catalyze. In the family, both parents and their son have the reduced activity of enzyme. Determine the probability of the birth of next child without anomaly. Determine

the probable children phenotypes in the family, in which one parent has disease and the other has the reduced activity of catalyze.

Problem 72. In shorthorn cattle, the gene R for red coat colour is not dominant over white r. The heterozygous combination Rr produces roan. A breeder has white, red and roan cows and bulls. What phenotypes might be expected from the following matings and in what proportions:
a. red x red
b. red x roan
c. red x white
d. roan x roan
e. roan x white
f. white x white

Problem 73. In snapdragons, flower colour shows intermediate inheritance rather than dominance. Homozygous plants, RR, are red, heterozygous Rr are pink, and homozygous rr are white. Diagram a cross between a red–flowered and a white–flowered plant and summarize the F results under the headings of phenotypes, genotypes, genotypic frequency, and phenotypic ratio.

Problem 74. Sickle cell anemia (S-anemia) is inherited as autosome incomplete dominant character. Homozygotes die before puberty, the heterozygotes have subclinic anemia. The plasmodium can not use the S-hemoglobin and human with S-anemia has no malaria.
What is the probability of the birth of children stable to malaria, in family in which one parent is heterozygous for S-anemia and the other is healthy? What is the probability of the birth of children not stable to malaria, in family, in which both parents are stable to malaria?

Problem 75. The human blood groups of ABO system are determined by three allelic genes: I^A, I^B, i^0 . The combination of alleles i^0 i^0 determine the I(O) blood group, I^A I^A or I^A i^0 - II (A); I^B I^B or I^B i^0 - III (B); I^A I^B - IV (AB). In the family, in which mother has II blood group and heterozygote, father - IV blood group. Determine the blood groups of their children.

Problem 76. In the family, in which brown-eyed parents, one of them had I blood group and another one - III blood group there was born blue-eyed child with first blood group. Determine the parental genotypes.

Problem 77. Can a child having blood type A be born to parents having types AB and B respectively? Explain.

Problem 78. A man has blood type A and his wife has type B. A physician types the blood of their four children and is amazed to find one of each of the four blood types among them. He is not familiar with genetics and calls upon you for an explanation. Provide one.

Problem 79. In the family, in which the wife had the II blood group and her husband had the III blood group, there was born the son with colour blindness and the I blood group. Both parents differed colours in norm. Determine the probability of the birth of the healthy son and his possible variants of blood groups. It is known that colour blindness is X-linked recessive disorder.

Problem 80. The pea plant flowers may have white and red colour. This sign is controlled by two pairs of alleles. The red colour of flowers is a result of complementary interaction of genes. In the cross of two pure lines with white colour of flowers, all F_1 progeny have red colour of flowers. There is cross of F_1 hybrid and homozygous recessive for both genes pea plant. Determine the F_2 genotypes and ratio.

Problem 81. Bombay phenomenon: in the family, in which the father had I blood group and mother – II blood group there was born the daughter with I blood group. She got married to the man with II blood group. They had two daughters with the following blood groups – IV and I, correspondently. The appearance of the girl with the IV blood group is impossible, according the principles of inheritance of blood groups. Geneticists proved that there is recessive epistatic gene, which may inhibit the appearance of genes, determining the blood groups. Determine the probable genotypes of all generations in Bombay phenomenon.

Problem 82. Podagra is determined by autosome dominant gene. It's known, that the penetrance of this gene in man is 20%, but in woman is 0%.
a) What is the probability of the birth of children with disease in the family in which both parents are heterozygotes for podagra?

b) What is the probability of the birth of children with disease in family in which one parent is heterozygote for podagra and the other is healthy?

Problem 83. Some forms of schizophrenia are inherited as autosome dominant characters. The penetrance of the gene in homozygotes is 100%, and in heterozygotes is 20%.
a) Determine the probability of the birth of children with disease in the family, where one parent is heterozygote, and the other is healthy for schizophrenia.

b) Determine the probability of birth of the children with disease in family where the both parents are heterozygotes for schizophrenia.

Problem 8**4**. Arachnodactily is controlled by autosome dominant gene with the penetrance of 50%. Left-hand writing is autosome recessive character with complete penetrance. Determine the probability of the birth of children with arachnodactily and left-hand writing in the family in which both parents are heterozygous for both characters.

Problem 8**5**. Brown colour of eyes is autosome dominant character and dominates over blue colour. Retinoblastoma is controlled by autosome dominant gene with the penetrance of 60%.

a) What is the probability of the birth of the blue-eyed children with disease in the family in which both parents are diheterozygotes?

b) What is the probability of the birth of brown-eyed healthy children in the family in which both parents are diheterozygotes?

Fundamentals of General and medical ecology. Medical parasitology.

Medical protozoology. Medical helminthology. Medical Arachno-Entomology.

1. The patient of 42 years old complains on acute headache, tenderness of the muscles of the extremities. The general weakness, fever, edemas around the eyes developed a week ago. The physician diagnosed influenza and prescribed Amixin IC. An improvement didn't come. His wife also fell ill. She complaints of muscle pain, bad condition. They had eaten fried pork, bought 12 days ago. The temperature is 38, 3□C, the face is edematous. The muscles of extremities are painful. The abdomen is soft. Stool is 2 times per day. In the blood count: Нв-133 g/l, L-15,0, B-1 %,E-40 %, U-1 %,B-7 %,S-3%,L-8 %, M-6%, ESR-25 mm /h. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

2. The patient of 40 years old was referred with complaints of high temperature to 39□C, pains in the eyes and muscles. The disease began with general weakness, digestive disturbances. The patient had pork, bought from the neighbour 2 weeks ago. Objectively: there are edema of the face, plentiful exudative-papular eruption on the body, adynamia, symptoms of myocarditis. In the blood count eosinophilia (45 %) is marked. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

3. The patient of 42 years old complains of acute headache, tenderness of the muscles of the extremities. The general weakness, fever, edemas around the eyes developed a week ago. The physician diagnosed influenza and prescribed Amidopyrinum. An improvement didn't come. His wife also fell ill. She complaints of muscle pain, bad condition. They had eaten fried pork, bought 12 days ago. The temperature is 38,3□C. the face is edematous. The muscles of extremities are painful. The abdomen is soft. Stool is 2 times per day grueled. In the blood count: Нв-133 g/l, L-15,0, B-1 %,E-40 %, U-1 %,B-7 %,S-3%,L-8 %, M-6%, ESR-25 mm /h. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

4. The patient of 25 years old complains of weakness, nausea, pain in the right iliac area, stool 3-4 times a day, without pathological admixtures, periodically meteorism. She has been sick for 2 years. The sharp increase of the appetite, and following its decrease was marked in the beginning of the disease. At the last time she paid attention on discharge of the tape formations in defecation and in the bad in the morning. These formations have white color and size 1-2 cm in diameter. Epidemiological anamnesis: she is a cook. She frequently taste uncooked beef mince. Objectively: The skin and visible mucous membrane are pink. The tongue is coated with white fur. The peripheral lymphatic nodules are no palpated. The pulse rate is 72 beats per minute, rhythmical. Heart sounds are muffled. The lungs are without peculiarities. The abdomen is soft, inflated and painless during palpation. The liver and the spleen are no palpated. There is eosinophilia and anemia in general blood analysis. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

5. The patient of 21 years old complains of pain in the epigastrium, heartburn, nausea, decreased appetite, weakness, loss of weight, irritability, constipations, alternated by diarrhea. She works as an

accountant on a fish farm. On examination: paleness of her skin and mucous membranes, the tongue of bright red color with flatted papillas are reveled, the pains are on percussion of the breastbone. The liver and spleen are enlarged a little. There are decreased level of hemoglobin, erythrocytes of large sizes, color index – 1.2 in general blood analysis. The number of eosinophiles in increased. Gastric acholia is determined in the investigation of the gastric contents. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

6. The woman of 36 years old is a worker of the fish plant. She came to the polyclinic with complaints of heartburn, unstable stool, weakness. The itching rash periodically developed on the body. On examination: her skin is pale, single elements of urticaric rash are marked. The stomach is soft, slightly painful around the umbilicus. On examination of the blood: hyperchromatic anemia, eosinophilia to 9% are marked. What is the preliminary diagnosis? What methods are used for diagnostics of the disease?

7. Is there a clinically important difference between Taenia solium and Taenia saginata? Is it possible to differentiate the eggs under a microscope?

8. At a school nurse's request, a clinic in rural sees a 9-year-old girl who appears listless and inattentive, although hearing and visual testing has been within normal limits. The physician finds the child thin, with the "potbelly" of malnutrition, and orders a fecal exam and CBC. The CBC reveals a microcytic, hypochrornic anemia, and the fecal exam detects numerous eggs with thin shell and clear space between the developing embryo (about an 8- to 32-cell stage of development) and the shell. They are oval with broadly rounded ends and measure approximately 60 μm long by 40 μm wide. What was the most likely means by which this child was infected?

9. Congo. A 29-year-old man has been coughing for five weeks. There is eosinophilia. Sputum for acid-fast bacilli is negative. Your colleague asks whether the man ate crabs a few months ago. What diagnosis is he considering?

10. Mexico. Epilepsy is common in the region where you work. Which parasitic cause needs to be ruled out? What would you advise as prevention?

11. Brazil. A woman has had problems for one week with a swollen, puffy face, chiefly around the eyes. Do you consider trichinellosis, Chagas’ disease or nephrotic syndrome? What do you do? Are there simple tests which can help in your diagnosis?

12. Vietnam. A man has diarrhoea. Examination of the faeces for parasites shows: "Countless eggs of Trichinella spiralis". What do you think and what do you do?

13. Four weeks after his arrival from India, a 24-year-old graduate student presents with blood in his urine. Microscopic examination of his urine reveals the presence of eggs with terminal spines. In the interview he admits that he has been working on his family's rice field occasionally since his early childhood. What is he most likely etiologic agent of his complaint?

14. Jamaica. A 15-year-old girl is suffering from anal itch. There are no haemorrhoids and repeated Scotch tape tests have shown no oxyurids. She has not noticed any Taenia proglottids. There are a few itching lines moving under the skin. What do you think and what do you do?

15. The mother of a 4-year-old child notes that her child is sleeping poorly and scratching his anal area. You suspect the child may have pinworms. What is the BEST method to make that diagnosis?

16. Haiti. A girl has had fever for 2 months and is clearly emaciated. She coughs often. In the stools Ascaris eggs are observed. What do you think?

17. If all the snails in an area are destroyed, will this have an effect on nematode, trematode or cestode infections?

18. A 11-year-old boy from India was brought to the emergency room with a prolapsed rectum. Examination of the rectum reveals small worms that resemble whips attached to the mucosa. A stool sample reveals eggs that are barrel shaped, with bipolar plugs. Which of the following is the most likely cause?

19. Farouk is a deeply devout Muslim and works as an archaeologist in rural Mexico, together with his German friend Jurgen and his American colleague John. Jurgen is a vegetarian and John likes his daily portion of meat. Can Farouk and Jurgen develop cysticercosis? Can John?

20. A 5-year-old boy presents to his pediatrician with intense perianal itching. His mother explains that the child has also been extremely irritable during the day and has not been sleeping well at night. Eggs with a flattened side were identified by the laboratory technician from a piece of scotch tape brought in by the parent. Infection with which of the parasite is most likely?

21. Lesotho. A Swiss family of 4 people. The father suffers regularly from anal itch. He has noticed oxyurids and taken mebendazole (Vermox®). After a month the same symptoms return. The whole family is now treated with Vermox®. However, there is another relapse after 4 weeks. Do you now consider resistance, exogenous re-infection or incomplete treatment?

22. Congo. You suspect trichinellosis in a patient. A small muscle biopsy is surgically removed from the quadriceps. This muscle fragment is pressed between 2 glass slides. Can you look at the whole biopsy to find the encapsulated larvae with a simple magnifying glass or do you need a microscope?

23. Bolivia. You are working in the northern Altiplano, between Lake Titicaca and the capital. This is a region with many animals (sheep, cattle, pigs, goats, horses, donkeys, llamas, alpacas). Would this information be important to explain the high incidence of fasciolasis?

24. To the dermatologist came the young man, suffering from acne on his face. During the study was taken material from the internal contents of acne and were found arthropods (0.5 mm.) They had a worm-like shape and reduced four pairs of limbs placed in the front of the body. What kind of parasite is this?

25. The child complains of itching between the fingers and the lower abdomen which is worse at night. Skin analyzing revealed mite size of 0.3 - 0.4 mm. Specify the type of parasite:

Federal State Budget Educational Institution of Higher Education "North Ossetian State Medical Academy" of the Ministry of Health of the Russian Federation

Department of Biology and Histology

COLLECTION OF TESTS

«Biology»
the main professional educational program of higher education - specialty program in the specialty 31.05.03 Dentistry

For the first year students who study in English

Contents

ENTRANCE TESTS

1. Organelles in eukaryotic cells which contain digestive enzymes for degrading damaged macromolecules and polysaccharides are _____.
A: Lysosomes
B: Golgi bodies
C: rough endoplasmic reticulum
D: vacuoles

2. The greatest degree of genetic variability would occur among organisms that reproduce via:
A: sexual recombination
B: asexual propagation
C: sporulation
D: mitosis

3. The 3-nucleotide sequence on DNA which specifies a particular amino acid is known as a _____.
A: codon
B: anti-codon
C: promotor
D: transcription factor

4. DNA replication occurs during_____.
A: interphase
B: prophase
C: metaphase
D: telophase

5. During alternation of generations, cells reproduce by _____.
A: mitosis
B: meiosis
C: both meiosis and mitosis
D: none of the above

6. Human blood types are governed by the independent alleles A and B. If both alleles are present, the person's blood type is AB. The expression of both alleles equally is called :
A: codominance
B: complete dominance
C: incomplete dominance
D: epistasis

7. Bacteria are said to be prokaryotic because they lack a
A: true nucleus
B: cell membrane
C: cell wall
D: ribosome

8. Match the processes occurring in spermatogenesis with the stages of spermatogenesis

PROCESS	STAGE:
A. first division of meiosis	1) Growth phase
B. acrosome and tail formation in sperm	2) multiplication phase
C. formation of spermatogonia	3) Spermiogenesis
D. formation of primary spermatocytes	4) Maturation phase
E. second division of meiosis	

9. If the protein consists of 100 amino acids, then the number of nucleotides in it’s gene is _____

10. Determine the correct sequence of listed processes of meiosis. Enter only the sequence of digits.
1) the location of pairs of homologous chromosomes in the equatorial plane
2) conjugation, crossing over homologous chromosomes
3) the separation of chromatids
4) the formation of four haploid nuclei
5) the homologous double-chromatid chromosomes move to the opposite poles of cell

10. Which cell feature is responsible for making proteins?
A: lysosomes
B: ribosomes
C: mitochondria
D: smooth ER

11. Genetic variability between individuals of a population or species is caused by:
A: random mutations
B: non-hereditary variability
C: mitosis
D: asexual reproduction

12. Protein synthesis occurs on the _____ which are complexes of proteins and _____.
A: ribosomes, rRNA
B: Golgi bodies, rRNA
C: lysosomes, rRNA
D: peroxisomes, rRNA

13. During the cell cycle, the cell spends the most time in _____and the least amount of time in_____.
A: prophase, metaphase
B: anaphase, telophase
C: prophase, telophase
D: interphase, anaphase

14. What is one difference in mitosis and meiosis during anaphase I?
A: the chromosomes line up at the equator in anaphase I.
B: centromeres do not exist in anaphase I.
C: chromatids do not separate at the centromere in anaphase I.
D: crossing-over occurs only in anaphase of mitosis

15. Which two functional groups can be found in carbohydrates?
A: carboxyl and amine
B: amine and sulfhydryl
C: carbonyl and hydroxyl
D: hydroxyl and phosphate

16. How many types of gametes CcDd heterozygote forms, if it is known that genes C (c) and B (b) are completely linked.
A: one
B: two
C: three
D: four

17. Match the names of cells formed during spermatogenesis and its stage.

FORMED CELLS:	STAGE:
A. secondary spermatocytes	1) Growth phase
B. Sperm	2) multiplication phase
C. Spermatogonia	3) Spermiogenesis

D. primary spermatocytes 4) Maturation phase
E. Spermatids

18. If the protein consists of 600 amino acids, then the number of nucleotides in it's gene is _____

10. Determine the correct sequence of listed processes of meiosis. Enter only the sequence of digits.
1) the location of pairs of homologous chromosomes in the equatorial plane
2) conjugation, crossing over homologous chromosomes
3) the separation of chromatids
4) the formation of four haploid nuclei
5) the homologous double-chromatid chromosomes move to the opposite poles of cell

19. Where in the cell does DNA replication take place?
A: ribosomes
B: nucleus
C: nucleolus
D: Golgi body

20. Photosynthesis and respiration in the biosphere are the basis of the cycle of
A: Nitrogen
B: Carbon
C: Calcium
D: Phosphorus

21. During oxidation of acetyl-CoA in the Kreb's cycle, electrons are transferred first to NAD+ to make NADH. These electrons are next transferred through the _____ with the production of _____.
A: electron transport system, ATP
B: electron transport system, glucose
C: plasma membrane, ADP
D: nuclear membrane, ATP

22. During protein synthesis, _____ transport amino acids to the growing polypeptide chain using _____ to place the appropriate amino acids in the right order.
A: tRNA's, anticodons
B: rRNA's, codons
C: mRNA's, codons
D: mRNA's, codons

23. If a cell that has 8 chromosomes goes through mitosis, how many chromosomes will each new cell have?
A: 4
B: 8
C: 16
D: 32

24. Compounds are considered organic if they contain:
A: phosphorus and water
B: nucleotides and silicon
C: water and oxygen
D: carbon and hydrogen

25. The complete dominance is interaction of alleles in which:
A: the dominant gene fully suppresses the effect of recessive
B: the dominant gene does not fully suppresses the effect of recessive
C: none of the gene inhibit the action of another
D: recessive gene inhibits the action of the dominant one

26. Match the names of cells formed during spermatogenesis and its stage.

FORMED CELLS:	STAGE:
A. secondary spermatocytes	1) Growth phase
B. Sperm	2) multiplication phase
C. Spermatogonia	3) Spermiogenesis
D. primary spermatocytes	4) Maturation phase
E. Spermatids	

27. If the protein consists of 300 amino acids, then the number of nucleotides in it's gene is _____

28. Determine the correct sequence of following list of protein structure. Enter the sequence of digits only.
1) structure of several subunits
2) polypeptide chain
3) globule
4) the formation of hydrogen bonds between different turns of the helix

29. What is one major feature that plant cells have that animal cells do not?
A: lysosome
B: cell wall
C: cell membrane
D: mitochondria

30. _____ authored the theory of evolution in his book, "On the Origin of Species".
A: Charles Darwin
B: Jean-Baptiste de Lamarck
C: Thomas Huxley
D: Albert Einstein

31. The molecular structure of DNA is a _____.
A: double helix
B: hairpin loop
C: single strand
D: tetramer

32. What is the name of the phase where the chromosomes become visible and the nuclear envelope disappears.
A: Metaphase
B: Telophase
C: Prophase
D: Anaphase

33. _____ is cell division in which the diploid number is reduced by one half (haploid) for the formation of gametes.
A: Meiosis
B: Mitosis
C: Photosynthesis
D: Evolution

34. A monomer is:
A: a type of covalent bond in organic molecules
B: a neurotransmitter in the brain
C: a building block of an organic molecule
D: a type of amino acid

35. The phenomenon of linked inheritance has been called:
A: Mendel's third law

B: the purity of the hypothesis of gametes
C: crossingover
D: Morgan Law

36. Match the names of cells formed during spermatogenesis and its stage.

FORMED CELLS:	STAGE:
A. secondary spermatocytes	1) Growth phase
B. Sperm	2) multiplication phase
C. Spermatogonia	3) Spermiogenesis
D. primary spermatocytes	4) Maturation phase
E. Spermatids	

37. If the protein consists of 500 amino acids, then the number of nucleotides in it's gene is _____

38. Determine the correct sequence of listed processes of meiosis. Enter only the sequence of digits.
1) the location of pairs of homologous chromosomes in the equatorial plane
2) conjugation, crossing over homologous chromosomes
3) the separation of chromatids
4) the formation of four haploid nuclei
5) the homologous double-chromatid chromosomes move to the opposite poles of cell

Cell biology.

1. In human beings 45,XO abnormality causes
    1. Down's syndrome
    2. Kinefelter's syndrome
    3. Turner's syndrome
    4. Edward's syndrome

2. Down's syndrome is due to
    1. crossing over
    2. linkage
    3. sex-linked inheritance
    4. nondisjunction of chromosomes.

3. The colour blindness is more likely to occur in males than in females because
    1. the Y-chromosome of males have the genes for distinguishing colours
    2. genes for characters are located on the X- chromosomes
    3. the trait is dominant in males and recessive in females
    4. none of the above.

4. An abnormal human male phenotype involving an extra X-chromosome (XXY) is a case of
    1. Edward's syndrome
    2. Klinefelter's syndrome
    3. intersex
    4. Down's syndrome

5. Down's syndrome in humans is due to
    1. three X chromosome
    2. three copies of chromosome 21
    3. monosomy
    4. two Y chromosomes

6. A person with the sex chromosomes XXY suffers from
    1. gynandromorphism
    2. Klinefelter's syndrome
    3. Down's syndrome
    4. Turner's syndrome.

7. XO chromosomal abnormality in human beings causes
    1. Turner's syndrome
    2. Down's syndrome
    3. Klinefelter's syndrome
    4. Edward's syndrome

8. XXY chromosomal abnormality in human beings causes

1. Turner's syndrome
2. Down's syndrome
3. Klinefelter's syndrome
4. Edward's syndrome

9. In human beings 47,XY,+13 abnormality causes
1. Down's syndrome
2. Patau syndrome
3. Turner's syndrome
4. Edward's syndrome

10. 47,XY,+18 chromosomal abnormality in human beings causes

1. Turner's syndrome
2. Down's syndrome
3. Klinefelter's syndrome
4. Edward's syndrome

11. The example of point mutation is found in a disease called
1. Down's syndrome
2. sickle cell anaemia
3. Klinefelter's syndrome
4. night blindness.

12. In which of the following diseases, the man has an extra X-chromosome?
1. Turner's syndrome
2. Klinefelter's syndrome
3. Down's syndrome
4. haemophilia.

13. Mongolian Idiocy due to 47,XY,+21 chromosome abnormality is called
1. Down's syndrome
2. Turner's syndrome
3. Klinefelter's syndrome
4. Triple X syndrome.

14. Number of Barr bodies in XXXX female is
1. 1
2. 2
3. 3
4. 4

15. A girl with 47 chromosomes due to three copies of chromosome 18 is characterized by
1. super femaleness
2. Edward's syndrome

3. Turner’s syndrome
4. Down’s syndrome.

16. Cri-du-chat syndrome in humans is caused by the
1. trisomy of 13st chromosome
2. fertilization of an XX egg by a normal Y-bearing sperm
3. loss of half of the short arm of chromosome 5
4. missense mutation

17. The chromosome with the equal arms and centromere in the middle is:
1. Metacentric
2. Submetacentric
3. Acrocentric
4. Telocentric

18. If the centromere is slightly offset from the center of the chromosome, and the arms slightly unequal, this chromosome is called:
1. Metacentric
2. Submetacentric
3. Acrocentric
4. Telocentric

19. If the centromere is near one end of the chromosome, and arms are very unequal, this chromosome is called:
1. Metacentric
2. Submetacentric
3. Acrocentric
4. Telocentric

20. If the centromere is at one end of the chromosome, and the arms are on one side only, this chromosome is called:
1. Metacentric
2. Submetacentric
3. Acrocentric
4. Telocentric

21. Which of the following must happen first in order for DNA replication to occur?
1) DNA polymerase binds to the leading strand
2) Helicase begins to break the hydrogen bonds
3) Hydrogen bonds form between bases
4) Chromosomes condense

22. Okazaki fragments form on the:

1) lagging strand
2) leading strand
3) base-pairs
4) 5' end

23. Which of the following is required for DNA replication to occur?

1) DNA helicase
2) DNA ligase
3) DNA polymerase
4) all of these

24. A nucleotide consists of:

1) a nitrogen base
2) a nitrogen base and a sugar
3) a nitrogen base, sugar, and phosphate
4) nitrogen base, a sugar, and three phosphates

25. Which of the following would be classified as the purines?

1) Adenine and Thymine
2) Adenine and Guanine
3) Adenine and Cytosine
4) Thymine and Cytosine

26. The backbone of the DNA structure is made up of...

1) Alternating phosphates and sugar molecules
2) Nitrogen-containing bases
3) Alternating bases and sugars
4) Alternating phosphates and bases

27. A DNA strand has the following bases: A A G C C A. What are the bases on its complimentary strand?

1) A A G C C A
2) A C C G A A
3) T T C G G T
4) C C A T T C

28. Universality of the genetic code:

1. each amino acid is encoded by 3 nucleotides
2. each nucleotide is part of only one triplet.
3. the genetic code is the same for all living organisms.
4. each triplet encodes a strictly defined amino acid

29. If the protein consists of 500 amino acids, then the number of nucleotides in it’s gene is:

1. 300
2. 600
3. 900
4. 1500

30. Which of the following is TRUE about gene mutation

1. The exchange of DNA between chromosomes during meiosis.
2. The movement of a ribosome from one reading frame to another at an internal position within a gene
3. A DNA repair process that corrects various types of DNA damage by excising and resynthesizing a region of polynucleotide
4. Permanent, heritable alterations in the base sequence of the DNA.

31. Change in one amino acid in a protein, arising from a point mutation in a single nucleotide is:

1. Nonsense mutation
2. Frameshift mutation
3. Silent mutations
4. Missense mutation

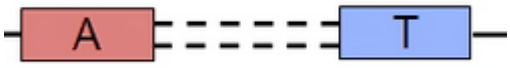
32. Constitutive heterochromatin containing

1. the genes that are actively transcribed
2. the genes that are always transcriptionally inactive
3. the genes of prokaryotes
4. the Barr body

33. DNA is replicated during:

1. Metaphase
2. Interphase
3. Prophase
4. Anaphase

34. The dashed lines between the two bases represents...



1. Ionic bonding
2. Pyrimidial bonding
3. Phosphate-sugar bonds
4. Hydrogen bonds

35. Which of the following best represents Chargraff's rule of base pairing?

1. A bonds with T, C bonds with G always
2. A and G will always have double rings in their molecules
3. A bonds with C and G bonds with T
4. No such rule exists

36. Genetic Code is non-ambiguity. It means that:

1. each amino acid is encoded by 3 nucleotides
2. each nucleotide is part of only one triplet.
3. the genetic code is the same for all living organisms.
4. each triplet encodes a strictly defined amino acid

37. Protein consists of 120 amino acids. How many nucleotides has the gene in which this protein is encoded?

1. 60
2. 120
3. 240
4. 360

38. Gene mutation is best described as

1. The formation of a DNA molecule
2. A change in DNA sequence
3. A change in number of DNA molecules
4. A nucleotide in the DNA molecule

39. An alteration in a nucleotide sequence that leads to replacement of all amino acids in a protein is….

1. Nonsense mutation
2. Frameshift mutation
3. Silent mutations
4. Missense mutation

40. All human BODY CELLS contain this many chromosomes

1. 23
2. 46
3. 8
4. 45

41. Adjacent nucleotides in DNA strand are linked by:

1. a hydrogen bond
2. a phosphodiester bond
3. an ionic bond
4. a double bond

42. The amount of adenine is always equal to the amount of _____ in DNA.

1. Cytosine
2. Uracil

3. Guanine
4. Thymine

43. Degeneracy of the genetic code:

1. each amino acid is encoded by 3 nucleotides
2. amino acids can be encoded by several triplets.
3. the genetic code is the same for all living organisms.
4. nucleotides can be part of several triplets.

44. What is the number of nucleotides in a gene region that encodes the primary structure of a 300 amino acid in protein?

1. 100
2. 300
3. 600
4. 900

45. An alteration in a nucleotide sequence that do not have an observable effect on the organism's phenotype is…..

1. Nonsense mutation
2. Frameshift mutation
3. Silent mutations
4. Missense mutation

46. Aneuploidy is best described as

1. The formation of a DNA molecule
2. A change in DNA sequence
3. A change in number of chromosomes
4. A nucleotide in the DNA molecule

47. How many pairs of chromosomes are in a human body cell?

1. 46
2. 12
3. 23
4. 8

48. Which of the following phrases describes chromatin fibers (solenoid)?

1. Single ribosomes attached to mRNA
2. Complexes of DNA and all the histones except H4
3. H1 provide retraction adjacent nucleosomes
4. Complexes of protein and the 45S rRNA precursors found in the nucleolus

49. Match the types of nucleic acids and their signs.

SIGNS OF NUCLEIC ACIDS	TYPES OF NUCLEIC ACIDS
A. consists of two polynucleotide chains twisted into a spiral	1) DNA
B. consists of one polynucleotide chain	2) mRNA
C. transfers hereditary information from the nucleus to the ribosome	
D. is formed during transcription	
E. consists of nucleotides A, U, G, C	

A	B	C	D	E

50. Match the items listed in column I with suitable items from column II.

CHARACTERISTICS	TYPES OF CHROMOSOMES
A. centromere is at the middle of the chromosome	1.submetacentric
B. the centromere is slightly offset from the center of the chromosome	2.metacentric
C. the centromere is near one end of the chromosome	3.acrocentric
D. Arms are slightly unequal	
E. Arms are equal	

A	B	C	D	E

51. Match the items listed in column I with suitable items from column II.

CHARACTERISTICS	TYPES OF CHROMOSOMES
A. centromere is at the middle of the chromosome	1. telocentric
B. the centromere is slightly offset from the center of the chromosome	2. submetacentric
C. the arms are on one side only	3. metacentric
D. Arms are slightly unequal	
E. Arms are equal	

A	B	C	D	E

52. Match the types of nucleic acids and their signs.

SIGNS OF NUCLEIC ACIDS	TYPES OF NUCLEIC ACIDS
A. has the shape of a clover leaf	1) mRNA
B. copies information about the structure of the protein from DNA	2) tRNA

C. one of the triplets is an anticodon
D. serves as a template in the process of translation.
E. has the smallest size of nucleic acids

A	B	C	D	E

53. Match the types of nucleic acids and their signs.

SIGNS OF NUCLEIC ACIDS
A. consists of nucleotides A, U, G and C
B. transports amino acids to the ribosomes
C. is the template for transcription
D. deoxyribose is a part of it's nucleotide
E. the secondary structure has the form of a clover leaf.

TYPES OF NUCLEIC ACIDS
1) DNA
2) tRNA

A	B	C	D	E

54. Match the types of nucleic acids and their signs.

SIGNS OF NUCLEIC ACIDS
A. transports amino acids to the ribosomes
B. serves as a template in the process of translation
C. one of the triplets is an anticodon
D. forms ribosomes
E. has the form of a clover leaf.

TYPES OF NUCLEIC ACIDS
1) mRNA
2) tRNA
3) rRNA

A	B	C	D	E

55. Match the items listed in column I with suitable items from column II.

CELL FORMS

A. Primary spermatocyte
B. Secondary spermatocyte
C. Spermatogonia
D. Spermatids
E. Spermatozoon

AMOUNT OF HEREDITARY MATERIAL
1) 2n2c
2) 2n4c
3) n2c
4) nc

A	B	C	D	E

56. Match the items listed in column I with suitable items from column II.

CELL FORMS
A. Spermatozoon
B. Primary spermatocyte
C. Secondary spermatocyte
D. Spermatogonia
E. Spermatid

STAGES OF SPERMATOGENESIS
1) growth
2) formation
3) multiplication
4) maturation

A	B	C	D	E

57. Match the items listed in column I with suitable items from column II.

CELL FORMS
A. Spermatogonia
B. Primary spermatocyte
C. Secondary spermatocyte
D. Spermatids
E. Spermatozoon

AMOUNT OF HEREDITARY MATERIAL
1) nc
2) n2c
3) 2n2c
4) 2n4c

A	B	C	D	E

58. Match the names of cells formed during spermatogenesis and its stage.

FORMED CELLS:
A. secondary spermatocytes
B. Sperm
C. Spermatogonia
D. primary spermatocytes
E. Spermatids

STAGE:
1) Growth phase
2) multiplication phase
3) Spermiogenesis
4) Maturation phase

A	B	C	D	E

59. Match the characteristic and the type of cell division to which it belongs.

CHARACTERISTIC

A) the formation of daughter cells identical to the maternal

B) homologous chromosomes move to opposite poles of the cell

C) homologous chromosomes pair up to each other

D) gene exchange occurs between homologous chromosomes

E) division underlies vegetative reproduction of plants.

FORM OF CELL DIVISION

1) mitosis

2) meiosis

A	B	C	D	E

60. Match the names of the cells formed in the process of spermatogenesis, and the amount of hereditary material in them.

FORMED CELLS:	STAGE:
A. secondary spermatocytes	1) 2n2c
B. Sperm	2) nc
C. Spermatogonia	3) n2c
D. primary spermatocytes	4) 2n4c
E. Spermatids	

A	B	C	D	E

61. Match the characteristic and the type of cell division to which it belongs.

CHARACTERISTIC

A) haploid cells are formed with double-chromatid chromosomes

B) sister chromatids moves to different poles of the cell

C) crossing over occurs

D) bivalents line up at the equator

E) haploid set of chromosomes in prophase

F) in anaphase set of chromosomes is 2n2c

FORM OF CELL DIVISION

1) meiosis 1

2) meiosis 2

A	B	C	D	E	F

62. Match the processes occurring in spermatogenesis with the stages of spermatogenesis

PROCESS	STAGE:
A. first division of meiosis	1) Growth phase
B. cell division by mitosis	2) multiplication phase
C. formation of spermatogonia	3) Spermiogenesis
D. formation of primary spermatocytes	4) Maturation phase
E. second division of meiosis	
F. Acrosome and tail formation in sperm	

A	B	C	D	E

63. Match the characteristic of the process and the method of dividing the cell, which it illustrates.

CHARACTERISTIC

A) movement of homologous chromosomes to the opposite poles

B) conjugation of homologous chromosomes

C) the formation of four haploid daughter cells

D) the formation of two daughter cells with the number of chromosomes equal to the parent cell

E) gene exchange between chromatids of homologous chromosomes

FORM OF CELL DIVISION

1) meiosis

2) mitosis

A	B	C	D	E

64. Match the names of the cells formed in the process of spermatogenesis, and the amount of hereditary material in them.

FORMED CELLS:
A. secondary oocyte
B. second polar body
C. Oogonia
D. primary oocyte
E. ovum

STAGE:
1) 2n2c
2) nc
3) n2c
4) 2n4c

A	B	C	D	E

65. Match the feature of cell division and the method of division for which it is characteristic.

FEATURE OF DIVISION

A) two diploid daughter cells are formed

B) the maturation of gametes in animals

C) maintains the constancy of the number of chromosomes in the cells.

D) recombination of genes in chromosomes occurs

E) serves as a method for asexual reproduction of protozoa.

FORM OF CELL DIVISION

1) mitosis

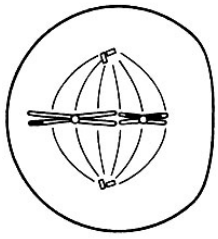
2) meiosis

A	B	C	D	E

66. For the cell division phase shown in the figure, it is characteristic:

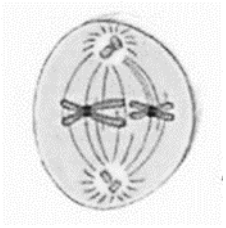
Form of division	
Division phase	
Set of genetic material	

67. For the cell division phase shown in the figure, it is characteristic:



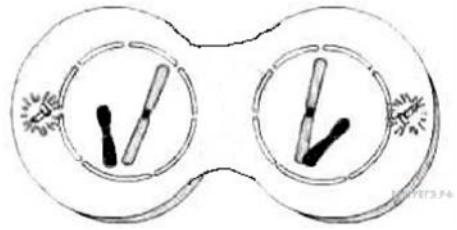
Form of division	
Division phase	
Set of genetic material	

68. For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

69. For the cell division phase shown in the figure, it is characteristic:

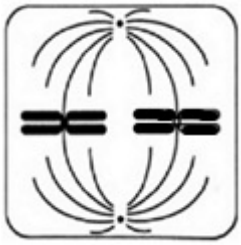


Form of division	
Division phase	
Set of genetic material in each cell	

70. For the cell division phase shown in the figure, it is characteristic:

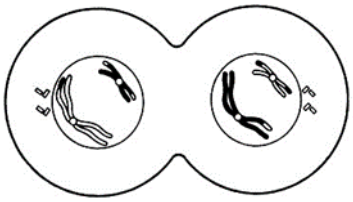
Form of division	
Division phase	
Set of genetic material	

71. For the cell division phase shown in the figure, it is characteristic:



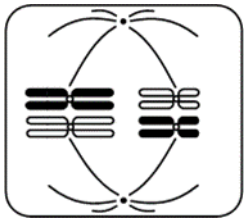
Form of division	
Division phase	
Set of genetic material	

72. For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material in each new cell	

73. For the cell division phase shown in the figure, it is characteristic:



Form of division	
Division phase	
Set of genetic material	

74. For the cell division phase shown in the figure, it is characteristic:

Form of division	
Division phase	
Set of genetic material	

75. Determine the correct sequence of listed processes of protein synthesis

1) recognition of terminator by RNA-polymerase
2) enter of tRNA with methionine in the P-site of the ribosome
3) detection of promoter by RNA-polymerase
4) 5' cap addition to mRNA
5) peptide bond formation
6) detection of a stop codon

76. Determine the correct sequence of listed processes of protein synthesis
1) enter of tRNA carrying methionine in the P-site of the ribosome
2) enter of second tRNA into the A-site of the ribosome
3) addition of amino acid to the acceptor end of tRNA
4) movement of tRNA with an amino acid to the ribosome
5) tRNA release from the ribosome

77. Determine the correct sequence of following list of protein structure.
1) polypeptide chain
2) globule
3) the formation of hydrogen bonds between different turns of the helix
4) structure of several subunits

78. Determine the correct sequence of listed processes of protein synthesis.

1) unwinding of the DNA molecule
2) formation of peptide bonds between amino acids
3) enter of tRNA with methionine in the P-site of the ribosome
4) detection of promoter by RNA-polymerase
5) splicing of mRNA
6) transcription

79. Determine the correct sequence of listed processes of protein synthesis.

1) movement of tRNA with an amino acid to the ribosome
2) enter of tRNA carrying methionine in the P-site of the ribosome
3) enter of second tRNA into the A-site of the ribosome
4) addition of amino acid to the acceptor end of tRNA
5) tRNA release from the ribosome

80. Determine the correct sequence of listed stages of prophase 1.

1) zygotene
2) leptotene
3) diplotene
4) pachytene
5) diakinesis

81. Determine the correct sequence of listed processes of meiosis.

1) the formation of two cells with a set of n2c
2) the separation of homologous chromosomes
3) a set of genetic information in the cell 2n2c
4) the arrangement of bivalents in the equatorial plate
5) conjugation, crossing over homologous chromosomes

82. Determine the correct sequence of listed processes of protein synthesis.

1. enter of second tRNA into the A-site of the ribosome
2. formation of peptide bonds between amino acids
3. enter of tRNA with methionine in the P-site of the ribosome
4. detection of promoter by RNA-polymerase
5. splicing of mRNA
6. transcription

83. Arrange this stages of prophase 1 in correct sequence.

1) zygotene
2) pachytene
3) leptotene
4) diplotene
5) diakinesis

84. Determine the correct sequence of following list of protein structure.

1) structure of several subunits
2) polypeptide chain
3) globule
4) the formation of hydrogen bonds between different turns of the helix

85. Determine the correct sequence of listed processes of meiosis.

1) the location of pairs of homologous chromosomes in the equatorial plane
2) conjugation, crossing over homologous chromosomes
3) the separation of chromatids
4) the formation of four haploid nuclei
5) the homologous double-chromatid chromosomes move to the opposite poles of cell

86. Determine the correct sequence of listed processes of protein synthesis.

1) enter of tRNA with methionine in the P-site of the ribosome
2) enter of second tRNA into the A-site of the ribosome
3) transcription
4) formation of peptide bonds between amino acids
5) unwinding of the DNA molecule
6) splicing of mRNA

ONTOGENESIS

1. What are the components of spermatozoon middle piece?
   1. nucleus
   2. axial fibers
   3. acrosome
   4. mitochondria

2. What is pronucleus?
   1. nucleus nc
   2. nucleus n2c
   3. zygote nucleus
   4. polar body nucleus

3. What is zygote?
   1. unicellular organism with male and female pronuclei
   2. double cellular organism with diploid chromosomal set
   3. unicellular organism with diploid chromosomal set
   4. double cellular organism with haploid chromosomal set

4. Which structure is bigger?
   1. oocyte
   2. zygote
   3. morula
   4. all are equal

5. Types of oocytes on the basis of the amount of yolk:
   1. Isolecithal, alecithal
   2. Centrolecithal, mesolecithal, telolecithal
   3. Centrolecithal, alecithal, polylecithal
   4. Alecithal, oligolecithal, mesolecithal, polylecithal

6. What is the type of amphioxus cleavage?
   1. Meroblastic, synchronic, unequal
   2. Meroblastic, asynchronic, unequal
   3. Holoblastic, synchronic, equal
   4. Holoblastic, asynchronic, unequal

7. What is the type of bird blastula?
   1. coeloblastula
   2. blastocyst
   3. amphyblastula
   4. discoblastula

8. Which layers of 7-14 days germ disk do you know?
   1. Epiblast and hypoblast
   2. Cytotrophoblast and syncytiotrophoblast
   3. Embryoblast and trophoblast
   4. Ectoderm, mesoderm and entoderm

9. What does acrosome mean?
1. Special granules in sperm
2. Mitochondria in the middle piece of sperm
3. Inclusions in the neck of sperm
4. Changed Golgi body at the tip of the head of sperm

10. Usual place of fertilization:
1. in ovary
2. in uterine
3. in uterine tube
4. in uterine mucosa

11. When does implantation begin in humans?
1. During the 1st day after fertilization
2. During 3rd day after fertilization
3. During 12th day after fertilization
4. During 6th day after fertilization

12. Types of oocytes on the basis of the amount of yolk:
1. Alecithal, oligolecithal, mesolecithal, telolecithal
2. Alecithal, oligolecithal, mesolecithal, polylecithal
3. Centrolecithal, telolecithal, isolecithal
4. Centrolecithal, alecithal, polylecithal

13. What is the type of amphibians cleavage?
1. Meroblastic, asynchronic, unequal
2. Meroblastic, discoidal
3. Holoblastic, synchronic, equal
4. Holoblastic, asynchronic, unequal

14. What is the type of amphioxus blastula?
1. coeloblastula
2. periblastula
3. amphyblastula
4. discoblastula

15. Which types of cells in blastocyst do you know?
1. Epiblast and hypoblast
2. Embryoblast and trophoblast
3. Cytotrophoblast and syncytiotrophoblast
4. Oocyte and spermatozoa

16. Which structures lie in the head of spermatozoon?
1. acrosome and nucleus
2. acrosome and proximal centriole
3. distant centriole and nucleus
4. microtubules and nucleus

17. How many chromosomes does human egg cell have?

1. 22 autosomes + 1 X or Y sex chromosome
2. 22 autosomes + 1 Y sex chromosome
3. 22 autosomes + 1 X sex chromosome
4. 22 pairs autosomes+ 1 pair sex chromosome

18. Types of oocytes on the basis of the distribution of yolk:
1. Alecithal, oligolecithal, mesolecithal, telolecithal
2. Alecithal, oligolecithal, mesolecithal, polylecithal
3. Centrolecithal, telolecithal, isolecithal
4. Centrolecithal, alecithal, polylecithal

19. What is the type of reptiles cleavage?
1. Meroblastic, synchronic, unequal
2. Meroblastic, discoidal
3. Holoblastic, synchronic, equal
4. Holoblastic, asynchronic, unequal

20. What is the type of human blastula?
1. celoblastula
2. blastocyst
3. amphyblastula
4. discoblastula

21. When does late gastrulation in humans begin?
1. During 3^{rd} – 4^{th} day after fertilization
2. During 1^{st} – 2^{th} day after fertilization
3. During 14^{th} – 15^{th} day after fertilization
4. During 27^{th} – 28^{th} day after fertilization

22. Which cells are motile?
1. oocytes
2. spermatozoa
3. spermatocytes
4. spermatids

23. Main result of fertilization is:
1. formation of blastula
2. nourishment of zygote
3. renewing of diploid chromosomal set
4. formation of sperm cell

24. What does acrosome reaction mean?
1. disappearance of granulosa cells
2. sperm penetration of the zona pellucida
3. releasing of cortical granules into the perivitelline space
4. second meiotic division of oocyte

25. Early embrio during cleavage is nourished by:
1. surrounding tissues

2. mucous
3. yolk inclusions
4. cortical granules

26. Types of oocytes on the basis of the distribution of yolk:
1. Alecithal, oligolecithal, mesolecithal, telolecithal
2. Isolecithal, telolecithal, centrolecithal
3. Alecithal, oligolecithal, mesolecithal, polylecithal
4. Centrolecithal, telolecithal, polylecithal

27. What is the type of human cleavage?
1. Meroblastic, synchronic
2. Meroblastic, asynchronic
3. Holoblastic, synchronic
4. Holoblastic, asynchronic

28. What is the type of amphibian blastula?
1. celoblastula
2. blastocyst
3. amphyblastula
4. discoblastula

29. When does early gastrulation in humans begin?
1. During 3rd day after fertilization
2. During 1st day after fertilization
3. During 14th day after fertilization
4. During 7th day after fertilization

30. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. nervous system	1) ectoderm
B. muscles	2) mesoderm
C. kidneys	
D. cornea	
E. nasal epithelium	

A	B	C	D	E

31. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. liver	1) endoderm
B. dermis	2) mesoderm
C. gonads	
D. thyroid gland	
E. pleura	

A	B	C	D	E

32. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. primordial germ cells	1) ectoderm
B. respiratory epithelium	2) endoderm
C. the epithelium of stomodeum	
D. nervous system	
E. pancreas	

A	B	C	D	E

33. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. peritoneum	1) mesoderm
B. blood and lymph vessels	2) endoderm
C. parathyroid gland	
D. gonads	
E. anterior lobe of pituitary gland	

A	B	C	D	E

34. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. eye lens	1) ectoderm
B. respiratory epithelium	2) endoderm
C. the epithelium of stomodeum	
D. nervous system	
E. pancreas	

A	B	C	D	E

35. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:
A. gastric and intestinal glands	1) mesoderm
B. blood and lymph vessels	2) endoderm
C. parathyroid gland	
D. gonads	
E. anterior lobe of pituitary gland	

A	B	C	D	E

36. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:	GERM LAYERS:

A. thymus gland
B. respiratory epithelium
C. the epithelium of stomodeum
D. nervous system
E. pancreas

1) ectoderm
2) endoderm

A	B	C	D	E

37. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:
A. cortex of adrenal glands
B. blood and lymph vessels
C. parathyroid gland
D. gonads
E. anterior lobe of pituitary gland

GERM LAYERS:
1) mesoderm
2) endoderm

A	B	C	D	E

38. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:
A. retina
B. muscles
C. kidneys
D. cornea
E. nasal epithelium

GERM LAYERS:
1) ectoderm
2) mesoderm

A	B	C	D	E

39. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:
A. lining of gut
B. dermis
C. gonads
D. thyroid gland
E. pleura

GERM LAYERS:
1) endoderm
2) mesoderm

A	B	C	D	E

40. Match the embryonic structures, and the germ layers, which give rice to them.

EMBRYONIC STRUCTURES:
A. cornea
B. respiratory epithelium
C. the epithelium of stomodeum
D. nervous system

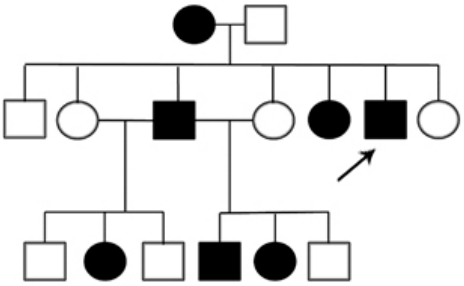
GERM LAYERS:
1) ectoderm
2) endoderm

E. pancreas

A	B	C	D	E

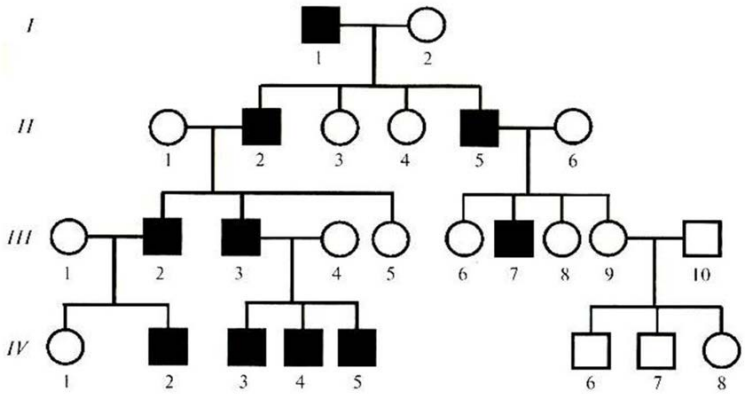
GENETICS

1. What is the most likely mode of inheritance for this pedigree?



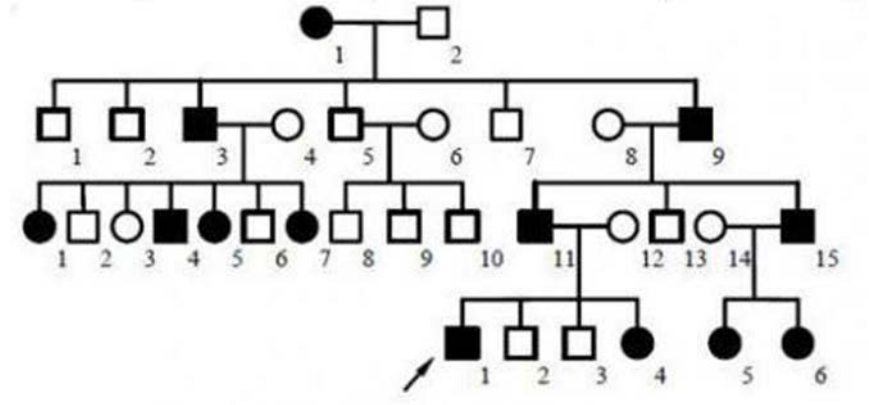
_____

2. What is the most likely mode of inheritance for this pedigree?



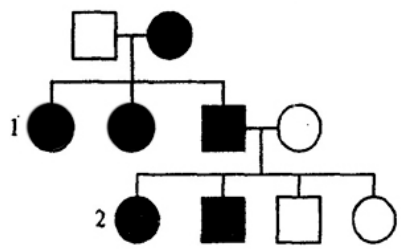
_____

3. What is the most likely mode of inheritance for this pedigree?



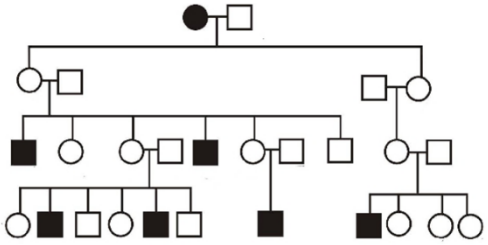
_____

4. What is the most likely mode of inheritance for this pedigree?



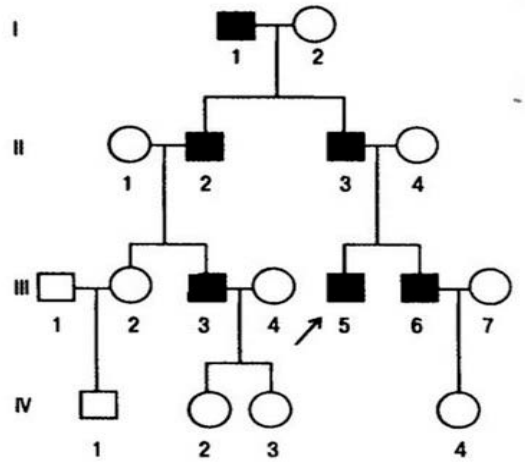
_____

5. What is the most likely mode of inheritance for this pedigree?



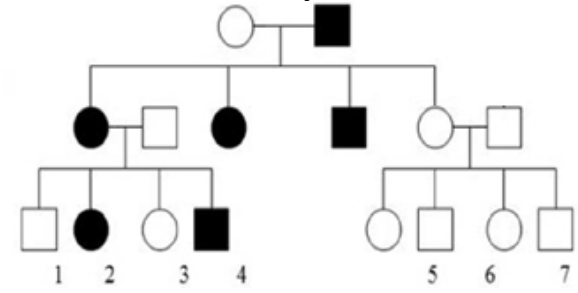
_____

6. What is the most likely mode of inheritance for this pedigree?



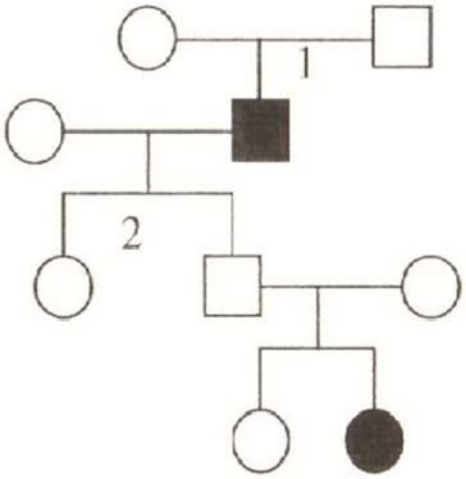
_____

7. What is the most likely mode of inheritance for this pedigree?



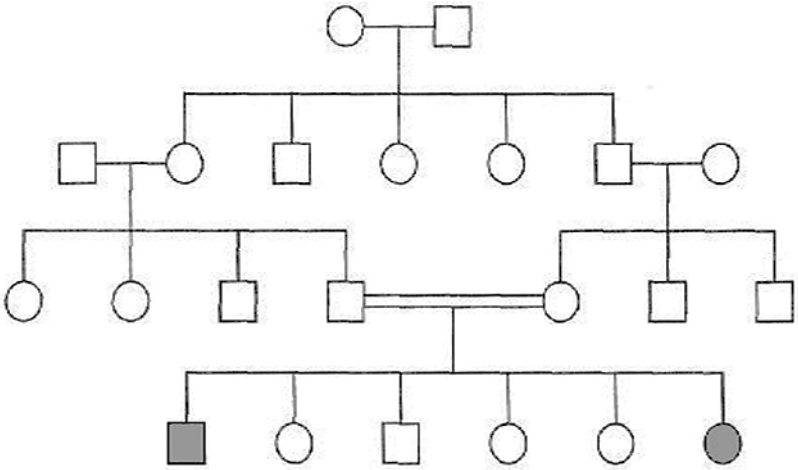
_____

8. What is the most likely mode of inheritance for this pedigree?



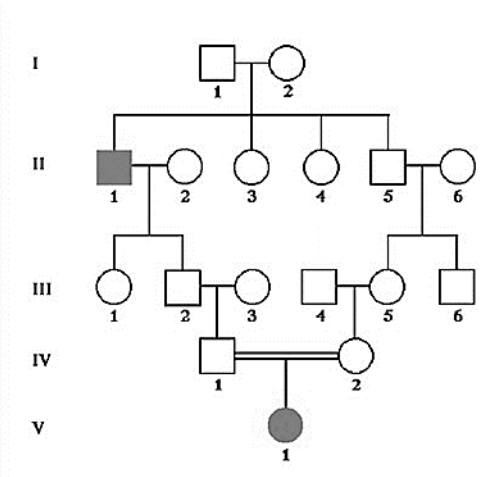
_____

9. What is the most likely mode of inheritance for this pedigree?



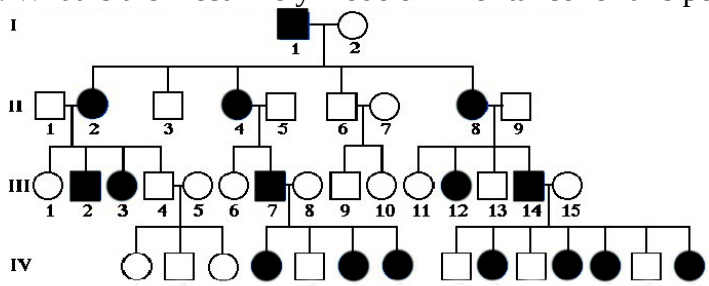
_____

10. What is the most likely mode of inheritance for this pedigree?



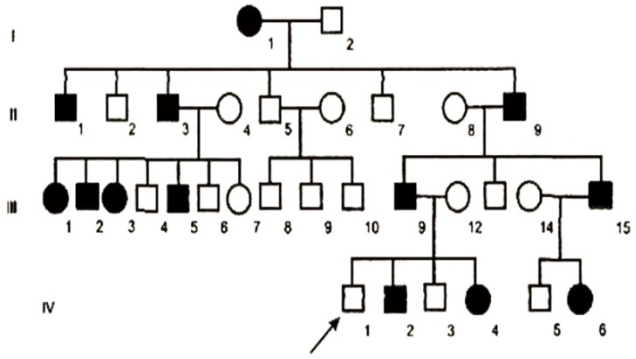
_____

11. What is the most likely mode of inheritance for this pedigree?



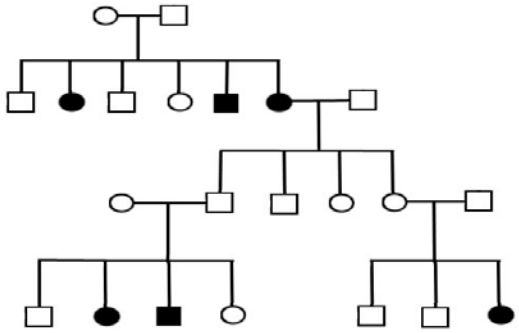
_____

12. What is the most likely mode of inheritance for this pedigree?



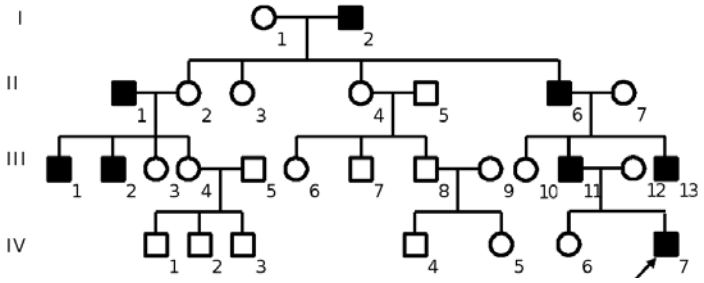
_____

13. What is the most likely mode of inheritance for this pedigree?



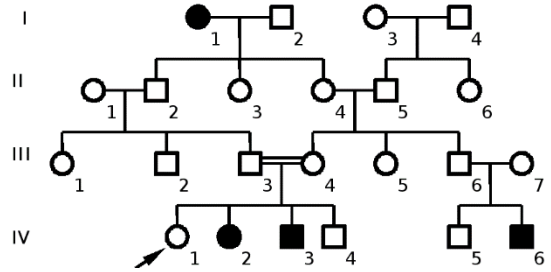
_____

14. What is the most likely mode of inheritance for this pedigree?



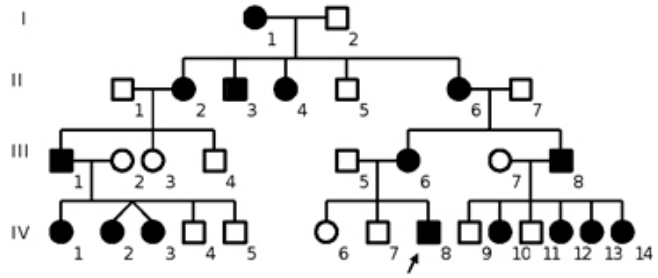
_____

15. What is the most likely mode of inheritance for this pedigree?



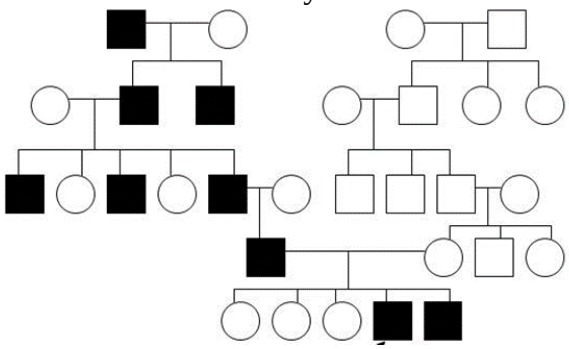
_____

16. What is the most likely mode of inheritance for this pedigree?



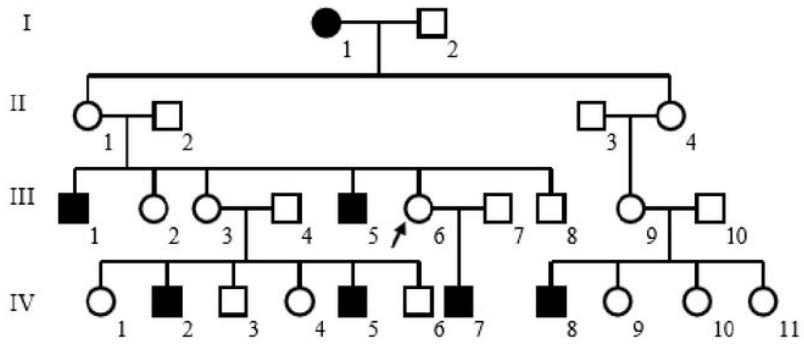
_____

17. What is the most likely mode of inheritance for this pedigree?



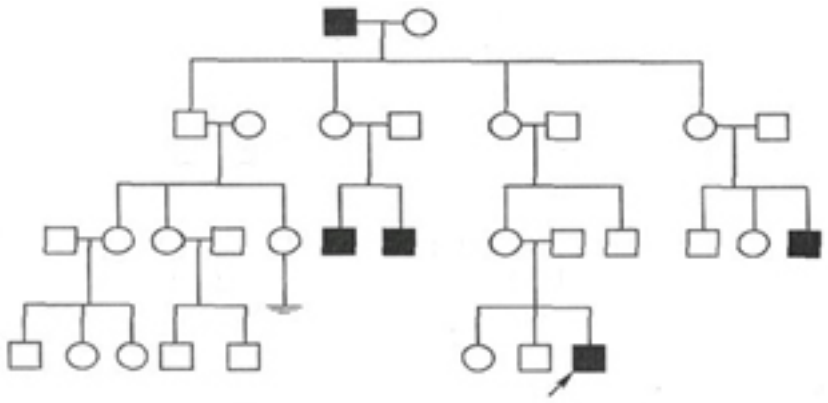
_____

18. What is the most likely mode of inheritance for this pedigree?



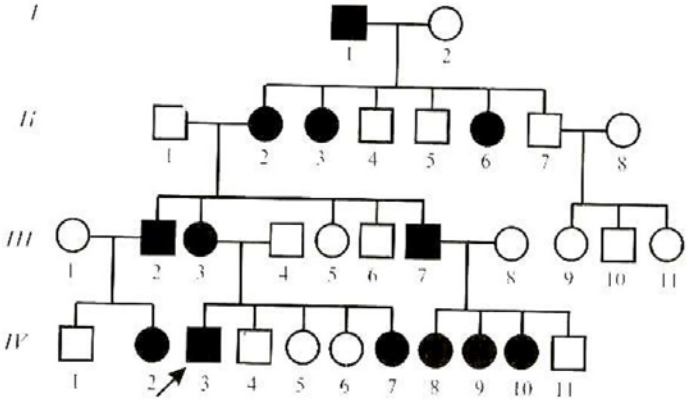
_____

19. What is the most likely mode of inheritance for this pedigree?



_____

20. What is the most likely mode of inheritance for this pedigree?



_____

Fundamentals of General and medical ecology.

1. The transmitter of Trypanosoma cruzi is:
    1. mosquitoes;
    2. Tsetse fly;
    3. Reduvlid bug;
    4. Housefly.

2. For the diagnosis of visceral leishmaniasis can be used:
    1. A bone marrow puncture;
    2. A Thick drop of blood;
    3. Microscopy of ulcer tissue;
    4. Microscopy of a blood smear;

3. The way of infection in congenital toxoplasmosis
    1. percutaneous
    2. transmissible
    3. alimentary
    4. transplacental

4. The definitive hosts of toxoplasma is:
    1. chicken
    2. cat
    3. human
    4. pig

5. Which of the following protozoans is transmitted primarily by the motile trophozoite form?
    1. Balantidium coli
    2. Entamoeba histolytica
    3. Giardia lamblia
    4. Trichomonas vaginalis

6. The transmitter of Leischmania donovani is:
    1. Phlebotomus sandfly;
    2. Glossina palpalis;
    3. Glossina morsitans;
    4. Reduvlid bug;

7. The causative agent of sleeping sickness is:
    1. trypanosoma;
    2. tsetse fly;
    3. mosquito;
    4. leishmania.

8. The infective stage of toxoplasma for human is:
    1. oocysts with sporozoites
    2. schizont

3. merozoite
4. micro - and macrogametocyte

9. Intermediate hosts in the cycle of Toxoplasma are not:
1. humans
2. birds
3. mammals
4. amphibians

10. A rural subsistence farmer from Brazil dies of heart failure. His autopsy shows a greatly enlarged heart. What was the vector for the most likely infectious agent that may have been responsible for his death?
1. Ixodes tick
2. Mosquito
3. Reduviid bug
4. Tsetse fly

11. The carrier of Trypanasoma brucei gambiense is:
1. Phlebotomus sandfly;
2. Glossina palpalis;
3. Glossina morsitans;
4. Reduvlid bug;

12. For the diagnosis of cutaneous leishmaniasis use:
1. A bone marrow puncture;
2. A Thick drop of blood;
3. Microscopy of ulcer tissue;
4. Microscopy of a blood smear;

13. Select the true statement regarding toxoplasmosis in humans:
1. Acute infection could be transmitted from mother to fetus
2. Is mainly diagnosed by serological tests
3. Is transmitted by ingestion of cysts in undercooked meat
4. All of the above

14. Diagnostic tests of malaria:
1. liver biopsy
2. smear or thick drop of blood
3. cerebrospinal fluid microscopy
4. biopsy of lymph nodes

15. Infection with American trypanosomiasis occurs:
1. When the feces of the Reduviid (“kissing”) Bug are rubbed into the bite site;
2. The bite of the Anopheles mosquito;
3. By the bite of sand fly;
4. By the bite of a tsetse fly;

16. Wild antelopes are the main natural reservoir for:
1. Leischmania donovani;

2. Trypanasoma cruzi;
3. Trypanasoma brucei rhodesiense;
4. Trypanasoma brucei gambiense;

17. Localization of Toxoplasma in the human body
    1. liver, pancreas, stomach
    2. heart, upper airways
    3. brain, lymph nodes, fetal membranes
    4. all answers are correct

18. The infective stage of toxoplasma for human is:
    1. micro - and macrogametocyte
    2. schizont
    3. merozoite
    4. oocysts with sporozoites

19. Mosquito responsible for malaria transmission
    1. Aedes aegypti
    2. Aedes albopictus
    3. Anopheles
    4. Haemagogus

20. Leishmanial forms (amastigote) is characterized by:
    1. An Elongated body shape;
    2. Round shape;
    3. Well-developed undulating membrane;
    4. The Absence of a flagellum;
    5. Long flagella;
    6. Large round nucleus.

21. BALANTIDIUM COLI:
    1. non-pathogenic;
    2. causative agent of balantidiasis;
    3. localizes in the blood;
    4. localizes in the large intestine;
    5. infection occurs by cysts through contaminated water, food, hands;
    6. infection occurs in contact with the patient.

22. ENTAMOEBA HISTOLYTICA IS CHARACTERIZED BY:
    1. occurs in the form of cysts, small, large and tissue trophozoite;
    2. life cycle with change of hosts;
    3. cyst has a dense cover and 8 nuclei;
    4. cyst has 4 nuclei;
    5. inhabits the small intestine;
    6. feeds on red blood cells.

23. Trypomastigote is characterized by:
    1. An Elongated body shape;
    2. Round shape;

3. Well-developed undulating membrane;
4. Long flagella;
5. The Absence of a flagellum;
6. Large round nucleus.

24. Leishmania tropica is characterized by:
1. cyst is 4-nucleic;
2. feeds on red blood cells;
3. sand flies are vectors;
4. amastigote stage in human;
5. localizes in small intestine;
6. causes a dry type of cutaneous lesion.

25. Morphological forms of Trypanosoma brucei
1. Amastigote
2. Promastigote
3. Epimastigote
4. Trypomastigote
5. Metacyclic trypomastigote
6. Cysts

26. Balantidium coli is characterized by:
1. cyst with contractile vacuoles;
2. secretes a proteolytic enzyme;
3. sand flies are vectors;
4. organelles of locomotion are cilia ;
5. localizes in small intestine;
6. causes a dry type of cutaneous lesion.

27. Match the disease and the causative agent:

A. Sleeping sickness	1) Leischmania donovani
B. Visceral leishmaniasis	2) Trypanasoma cruzi
C. Cutaneous leishmaniasis	3) Trypanasoma brucei
D. Chagas Disease	4) Leischmania tropica

A	B	C	D

28. RELATE SIGNS OF PARASITES:

Signs:	Parasites:
A. trophozoite is covered with pellicle	1. Entamoeba histolytica
B. trophozoite has 2 nuclei	2. Balantidium coli
C. the reservoir host is pig	
D. has an inconstant body shape.	

E. In the large intestine form magna is present.
F. f. Invasive stage is a 4-nuclear cyst.

a	b	c	d	e	f

29. Match the disease and the causative agent:

A. Visceral leishmaniasis	1) Leischmania donovani
B. Sleeping sickness	2) Trypanasoma cruzi
C. Cutaneous leishmaniasis	3) Trypanasoma brucei
D. Chagas Disease	4) Leischmania tropica

A	B	C	D

30. MATCH THE CHARACTERISTICS OF THE CLASSES OF PROTOZOA:

Attributes:	Classes:
a) organelles of locomotion - pseudopodia.	1. Sarcodina
b) organelles of locomotion -cilia	2. Ciliophora

c) some representatives live in dental deposits.
d) body is covered with pellicle.
e) trophozoites contain 2 nuclei
f) undigested food particles are released in any part of the cell wall.

a	b	c	d	e	f

31. Match the disease and the causative agent:

E. Visceral leishmaniasis	1) Leischmania donovani
F. Sleeping sickness	2) Trypanasoma cruzi
G. Skin leishmaniasis	3) Trypanasoma brucei
H. Chagas Disease	4) Leischmania tropica

A	B	C	D

32. MATCH PARASITES AND THEIR SIGNS:

Signs	Parasites:
a. trophozoite is covered with pellicle	1. Entamoeba histolytica
b. trophozoite has a sucking disc	2. Giardia lamblia
c. jumble of axonemes in cyst	
d. has an inconstant body shape.	
e. In the large intestine form magna is present.	

f. forms focal ulceration of the intestinal mucosa.:

a	b	c	d	e	f

33. Match the disease and the causative agent:

A. Visceral leishmaniasis
B. Cutaneous leishmaniasis
C. Chagas Disease
D. Sleeping sickness

1) Leischmania donovani
2) Trypanasoma cruzi
3) Trypanasoma brucei
4) Leischmania tropica

A	B	C	D

34. RELATE SIGNS SARCODINA AND CILIATES WITH THE CLASSES TO WHICH THEY BELONG:

Attributes:
a) body shape non-constant
b) the shape of the body is constant.
c) Food comes through the cytostome.
d) one of the class representatives is Balantidium coli
e) 2-nuclear.
f) 1-nuclear.

Classes:
1. Sarcodina
2. Ciliophora

a	b	c	d	e	f

35. What is a personal prevention of fascioliasis?

1. Do not drink unboiled water from open reservoirs
2. Do not eat improperly salted fish
3. Do not eat raw crayfish and crabs
4. Do not eat bad pork meat

36. Put correct order of the stages for Paragonimus westermani life cycle:

1. Egg – larva – mature individuals
2. Egg – miracidium – sporocyst – redia – cercaria – metacercaria
3. Egg - sporocyst - miracidium — redia – cercaria – mature individuals
4. Egg - Sporocyst – miracidium – cercaria – redia

37. Specify the localization of Schistosoma mansoni in the human body:

1. The lumen of small intestine
2. The veins of the urogenital system
3. The gallbladder
4. In mesenteric vein

38. The laboratory examinations of Echinococosis is based on:

1. Ovoscopy of faeces
2. Ovoscopy of urine
3. Serologic reactions
4. Finding parasites and their eggs in a scrape of perianal zone

39. Autoinvasion by helminthes is possible in the case of:

1. Taeniarhynchosis
2. Heminolepidosis
3. Echinococcosis
4. Ascariasis

40. What is diagnostic method of ancylostomiasis?

1. Finding eggs on perianal region
2. Finding rhabditiform larva in feces
3. Finding microfilaria in feces
4. Finding eggs in feces

41. The localization of Trichocephalus trichiurus in human's body is:

1. Liver
2. Pancreas
3. Caecum
4. Small intestine

42. What is invasive stage of Enterobius vermicularis for humans?

1. Encapsulated larva
2. Eggs with larva
3. Rhabditiform larva
4. Adult worm

43. Dracunuculiasis is caused by the _____ worm and transmitted by the _____ vector.

1. Dracunculus medinensis; mollusc.
2. Mycobacterium ulcerans; fresh water crustacean.
3. Mycobacterium ulcerans; mollusc.
4. Dracunculus medinensis; fresh water crustacean

44. What is a pathogenicity of Wuchereria bancrofti?

1. Elephantiasis
2. Pressure, atrophy of the affected tissue
3. Pruritus
4. Liver damage

45. Onchocerciasis is caused by the filarial worm Onchocerca volvulus. Which of the following statements about O. volvulus is false?

1. Sand flies transmit the larval forms of O. volvulus to humans
2. Female worms produce embryonic microfilariae that swarm underneath of the epidermis and can enter the eye
3. Infection with O. volvulus causes itchy cutaneous lesions, skin rashes and depigmentation
4. The worm is encased in fibrous tissue that can present clinically as palpable subcutaneous nodules

46. What kind of worms can develop only with change of the hosts?

1. Enterobius vermicularis
2. Ancylostoma duodenale
3. Trichinella spiralis
4. Trichuris trichiura

47. What stage is invasive for the final host of the of Fasciola hepatica?

1. Readia
2. Metacercaria in freshwater fish
3. Sporocyst
4. Metacercaria on aquatic plants

49. Put correct order of the stages for Opisthorchis felineus life cycle:

1. Egg - sporocyst - miracidium — redia – cercaria – mature individuals
2. Egg - Sporocyst – miracidium – cercaria – redia
3. Egg – miracidium – sporocyst – redia – cercaria – metacercaria
4. Egg - Metacercaria – cercaria – sporocyst – redia

50. Which of the following is true regarding urinary Schistosomiasis?

1. Adult worms are found in the urinary bladder
2. It is marked by diarrhea and hepatosplenomegaly
3. It is caused by the parasite Schistosoma mansoni
4. It is transmitted by the Bulinus species of mollusc

51. By which Cestoda human being can be invaded if he consumes improperly cooked meat?

1. Fasciola hepatica
2. Schistosoma hematobium
3. Echinococcus granulosus
4. Taenia solium

52. Which parasite requires water for development of some stages?

1. Hymenolepis nana
2. Echinococcus granulosus
3. Diphyllobothrium latum
4. Ancylostoma duodenale

53. What is geographical distribution of Enterobius vermicularis?

1. Cosmopolitan
2. East Africa
3. West Africa
4. India

54. Specify the localization of Ancylostoma in the human's body:

1. Liver
2. Duodenum
3. Large intestine
4. Skin

55. What is personal preventive measure of ascariasis?

1. Washing hands before meals
2. Regular examinations of preschool children
3. Wearing shoes and other protective clothes
4. Inspection and cooking or freezing of pork

56. All of the following are symptoms of Dracunculiasis infection except:

1. Ulcer
2. Painful edema
3. Septic arthritis
4. Facial redness

57. What kind of nematodes is transmitted by bite of mosquito?

1. Dracunculus medinensis
2. Onhocerca volvulus
3. Ancylostoma duodenale
4. Wuchereria bancrofti

58. Which of the following does not accurately describe Lymphatic filariasis?

1. Elephantiasis is the most common manifestation
2. The intermediate vector is the blackfly
3. It is caused by the parasitic worms Wuchereria bancrofti and Brugia malayi
4. Adult worms are found in the lymphatic system

59. Which of the following statements about soil-transmitted helminthiases is false?

1. Hookworms can cause intestinal blood loss
2. Trichuris trichiura is located in the cecum
3. Ascaris lumbricoides females range from 20 to 35 cm in length
4. Pinworms are Biohelmintes

60. Put correct order of the stages for Fasciola hepatica life cycle:
1. Egg - sporocyst - miracidium — redia – cercaria
2. Egg - Sporocyst – miracidium – cercaria – redia
3. Egg – miracidium – sporocyst – redia – cercaria – metacercaria
4. Egg - Metacercaria – cercaria – sporocyst – redia

61. Localization of Dicrocoelium dendriticum in humans is:
1. The blood vessels of the urinary bladder
2. Liver
3. The blood vessels of the intestine
4. Urinary bladder

62. Which of the following strategies is best suited to control the spread of Schistosomiasis?
1. To cook meat properly
2. Mosquito nets
3. To wash vegetables properly
4. Treating water with molluscicides

63. One of these statements is <u>true</u> regarding tapeworms:
1. Long thin unsegmented tube-like bodies with anterior mouths and longitudinal digestive tracts.
2. All tapeworms have separate sexes with well-developed reproductive systems.
3. long flat ribbon-like bodies with a single anterior holdfast organ (scolex)
4. An oral sucker surrounding the mouth

64. What can be done to prevent the Echinococcosis?
1. Avoid consuming improperly cocked fish
2. Wash hands before eating
3. Processing of water reservoirs by spraying of certain preparations
4. Destruction of vectors.

65. Indicate the invasive stage of Trichuris trichiura for human?
1. Eggs with larva
2. Rhabditiform larva
3. Adult worm
4. Filariform larva

66. What kind of Nematode can be acquired by percutaneous invasion?
1. Ancylostoma duodenale
2. Trichuris trichiura
3. Entorobius vermicularis
4. Diphyllobotrhrium latum

67. What is the infective stage of Trichinella spiralis?
    1. Cercaria
    2. Encysted larva
    3. Miracidiun
    4. Eggs

68. Who is the intermediate host for Dracunculus medinensis?
    1. Mosquito
    2. Man
    3. Cyclops
    4. Blackfly

69. What is the infective stage of Wuchereria bancrofti?
    1. Microfilaria
    2. Egg
    3. Adult form
    4. Metacercaria

70. What kind of worms can develop only with change of the hosts?

    1. Ancylostoma duodenale
    2. Trichuris trichiura
    3. Entorobius vermicularis
    4. Diphyllobotrhrium latum

71. The main characteristics of the Trematodes class are:

    1. The excretory system protonephridia’s type
    2. Have the primary body cavity
    3. Sexually separated
    4. Open circulatory system

72. The patient is suspected with opistorchosis. What makes it possible to diagnose the disease?

    1. Detection of parasite eggs in the sputum
    2. Detection miracidiums in faeces
    3. Detection of eggs in the faeces
    4. Detection of eggs in the urine sediment

73. What are the main features of mature proglottides?

    1. are filled with fertilized eggs
    2. contain males and females reproductive organs
    3. contain only testes
    4. have well-developed ovaries

74. What are the main features of gravid proglottides?

    1. are filled with fertilized eggs

2. contain males and females reproductive organs
3. contain only testes
4. have well-developed ovaries

75. Associate Diphylobotrium latum with its larval stage:

1. Plerocercoid larva
2. Cercaria
3. Filariform larva
4. Redia

76. After what time eggs of Ascaris lubricoides become invasive?

1. 21 days
2. 4-6 hours
3. 7 days
4. 1 hour

77. What stage of Ancylostoma duodenale is invasive to humans?

1. Egg
2. Filariform larva
3. Rhabditiform larva
4. Adult worm

78. The laboratory examination of Trichinella spiralis is based on?

1. Detection of larvae in blood
2. Lumbar puncture
3. Stool examination
4. Muscle biopsy

79. What is diagnostic stage of Dracunculus medinensis?

1. Worm under the skin
2. Miracidium
3. Eggs in faeces
4. Eggs in sputum

80. What kind of nematodes is transmitted by bite of blackfly?

1. Wuchereria bancrofti
2. Onhocerca volvulus
3. Ancylostoma duodenale
4. Dracunculus medinensis

81. Specify the location of Wuchereria bancrofti in the human’s body:

1. Subcutaneous tissues
2. Lymphatic vessels
3. Lungs
4. Duodenum

82. How a person can become infected with Sarcoptes scabiei?

1. Insect bites
2. Contact with sick people
3. Passing of hemolimph with rickettsia into a wound on the skin
4. Crushing lice and passing of hemolymph into the wound

83. Larvae of ticks have:

1. Three pairs of walking limbs
2. Underdeveloped mouthparts
3. Size 6-8 mm
4. Four pairs of walking limbs

84. After walk through the forest, a man found a dark brown tick with dorsal scutum which was sucking his leg. Specify the family of this tick?

1. Family Gamasoidae
2. Family Ixodidae
3. Family Aranei
4. Family Argasidae

85. What kind of mites which found in countries with warm climates, has an oval body, no dorsal shield and live in caves?

1. Ornithodorus papillipes
2. Ixodes ricinus
3. Dermacentor pictus
4. Ixodes persulcatus

86. What kind of these ticks can carry tularemia?

1. Ixodes ricinus, Dermacentor pictus
2. Ixodes ricinus, Demodex folliculorum
3. Ixodes ricinus, Ornithodorus papillipes
4. Ixodes persulcatus, Sarcoptes scabiei

87. A scabies causative agent gets into the body during:

1. Contact with clothes of sick people
2. Insect bites
3. Passing of hemolimph with rickettsia into a wound on the skin
4. Crushing lice and passing of hemolymph into the wound

88. The child complains of itching between the fingers and the lower abdomen which is worse at night. Skin analyzing revealed tick size of 0.3 - 0.4 mm. Specify the type of parasite:

1. Ixodes persulcatus
2. Sarcoptes scabiei
3. Pulex irritans
4. Ornithodorus papillipes

89. What is pediculosis?

1. Pediculosis - skin disease caused by being infected with ticks
2. Pediculosis -heavy infestation of hair with lice
3. Pediculosis - skin disease caused by being infected with fleas
4. Pediculosis - skin disease caused by being infected with itch mites

90. Life cycle of fleas going through the stage:

1. Egg – larva – pupa – imago
2. Egg – larva –imago
3. Egg – pupa – imago
4. Egg– adult organism

91. A man diagnosed with phtiriasis. Specify where is the localization of the parasite:

1. On the skin of head
2. In the folds of clothes and underwear
3. At the hairy areas of the skin, except head
4. In the horny layer of the epidermis

92. Residents of the house noticed in their dark apartments wingless insect with a flattened laterally body. Determine the insects and what can they carry?

1. The bugs, vectors of Chagas' disease
2. Mites that carry the spirochete
3. The fleas that carry the plague bacteria
4. Cockroaches, vectors of pathogens of intestinal infections

93. The patient was diagnosed with Chagas' disease. Who is a carrier of this disease?

1. Cimex lectularius
2. Phthirus pubis
3. Pulex irritans
4. Triatoma infestans

94. A woman pays attention to the small wingless insects that jump, and in the morning on the body noticed the bite marks. Determine who is it?

1. Pediculus humanus capitis
2. Phthirus pubis
3. Pediculus humanus corporis
4. Pulex irritans

95. A woman was bitten by Anopheles maculipennis. What kind of helminths can transmit this mosquito?

1. Ancylostoma duodenale and Trichocephalus trichiurus
2. Wuchereria bancrofti and Brugia malayi
3. Loa loa and Onchocerca volvulus
4. Dracunculus medinensis and Trichinella spiralis

96. Adult insect makes angle 45 degrees to the surface, has spotted wings and long maxillary palps. Determine what kind of insect is it:

1. Mosquito Culex
2. Mosquito Anopheles
3. Pulex irritans
4. Black fly

97. Mosquito's larvae which did not have respiratory tubes and therefore placed on the surface of the water horizontally belongs to:

1. Culex
2. Muscidae
3. Chrysops
4. Anopheles

98. What features are typical to development of Culex?

1. Imago has dark spots on the wings
2. Eggs of mosquitoes have air belts
3. The larvae have a breathing siphon and placed in the water at an angle
4. Pupas have conical breathing trumpets

99. The larvae of Anopheles mosquitoes:

31. Have a conical respiratory siphon
32. Haven't a respiratory siphon
33. Have a respiratory siphon, which arranged at an angle to the surface
34. Have a cylindrical respiratory siphon

100. The patient lives in Central Asia. He has a cutaneous leishmaniasis. What insects are carriers of this disease?

1. Anopheles

2. Simuliidae
3. Phlebotomus
4. Culex

101. The larvae of Anopheles mosquitoes live in:

1. Contaminated pools, which well heated by the sun
2. Gutter
3. Damp basements premises
4. Exclusively in pure or nearly pure waters