1. What does sterilisation mean?
    a. Killing procedure of any kind of germs.
2. What does disinfection mean?
    a. Procedure where the number of the germs are reduced to a safety level.
3. Which parameters can influence the effectivity of the sterilisation?
    a. The number of the germs, the resistance of the germs, the concentration of the disinfectants, the presence of the organic materials, the initial time, the presence of the biofilm.
4. Parameters of the hot-air sterilisation cupboard protocol?
    a. 180°C; 1 hour, 160°C; 2 hours, 140°C; 3 hours.
5. Parameters of the autoclaving?
    a. + 1 atm overpressure, 121°C, 20-30 minutes or 134°C, +2 atm overpressure 10 minutes.
6. Chemical agents used for gas sterilisation?
    a. Etilene oxide, formaldehyde, beta-propiolacton
7. The theoretical background of plasma sterilisation?
    a. Hydrogen-peroxide in high electric field will form plasma stage. The produced free radicals will kill the microbes. At the end of the procedure will be produced water, oxygen and other nontoxic products.
8. Biological method used for checking the effectivity of the sterilisation.
    a. By *Bacillus/Geobacillus stearothermophilus* spores. If the procedure was performed in correct way, the spores cannot be cultivated.
9. Detection of the presence of pyrogenic material in drugs?
    a. LAL test; The blood of the horseshoe crab will coagulate in the presence of the LPS
10. What are the disinfectants?
    a. Chemical agents used on inanimate/non-living surfaces.
11. What are the antiseptic agents?
    a. Chemical agents used disinfection on animate (tissue, skin, mucous membrane) surfaces.
12. What does serological reaction mean?
    a. Reaction based on the antigen-antibody reaction performed in vitro.
13. What does agglutination mean?
    a. Serological reaction where the antigen is cell mediated.
14. What are the bacterial cell surface antigens?
    a. O: cell wall, H: flagella, K: capsule
15. What does antibody titre mean?

    a. The highest dilution fold or the lowest antibody concentration where we can see in vitro antigen-antibody reaction.

16. What does precipitation mean?
    a. Serological reaction where the antigen is soluble (enzyme, toxin or virus particle).
17. What does iatrogenic infection mean?
    a. Infection caused by medical staff during the investigation or treatment.
18. What does nosocomial infection mean?
    a. Infection occurred in hospital after 48 hours of the hospitalisation.
19. What are the contents of the vaccines?
    a. Live attenuated microbe; killed microbe, toxoid, antigens of the microbe.
20. What does native examination of the microbe mean in microbiology?
    a. The microbe is examined without killing procedure.
21. What kind of information can we got by light microscopically examination? (3 example)
    a. The size of the microbe, the shape of the microbe, the motility, the staining can be examined.
22. The solutions of the Gram-stain?
    a. Sodium oxalate, cristal violet, Iodine solution, 96% of ethanol, fuchsin or safranin.
23. What kind of devices can be used for anaerobic cultivation?
    a. Anaerostate, Gas-pack jar, high agar, anaerobic chamber.
24. Definitions: bacteriostatic, bactericide
    a. bacteriostatic: inhibits bacterial growth
    b. bactericide: kills bacteria
25. Definition: selective toxicity
    a. the antibiotic has an effect only on the bacteria, but not on the human host
26. Chemotherapeutic index?
    a. dosis tolerata maxima (DTM)/dosis curativa minima (DCM)
27. Cell wall synthesis inhibitor antibiotics?
    a. Penicillin, Cephalosporin, Carbapenem, Glycopeptide.
28. Glycopeptide antibiotics
    a. vancomycin, teicoplanin
29. Membrane function alternating antibiotics are:
    a. Polymyxines
30. What are the protein synthesis inhibitor antibiotics? (3 example)

a. Aminoglycosides, Tetracycline, Macrolide, Chloramphenicol, Linezolid

31. Nucleic acid synthesis inhibitors are: (2 example)
    a. Quinolones, rifampicin, sulphonamide, trimethoprim.
32. Three possible ways of horizontal gene transfer
    a. conjugation (plasmid)
    b. transduction (bacteriophage)
    c. transformation (uptake of naked DNA from the environment)
33. Antibiotic resistance mechanism are:
    a. Enzymatic degradation or modification of the antibiotics, efflux pump, modifying of the antibiotic binding site
34. What does MRSA mean?
    a. Methicillin-resistant *Staphylococcus aureus*
35. What does ESBL mean?
    a. Extended spectrum of beta lactamase enzyme.
36. What does MIC mean?
    a. Minimal bacteriostatic concentration of an antibiotic measured in ug/ml.
37. What does MBC mean?
    a. Minimal bactericidal concentration of an antibiotic measured in ug/ml.
38. Definitions: MBL, MACI, PACI
    a. MBL: metallo-beta-lactamase (=carbapenemase)
    b. MACI: multi-resistant *Acinetobacter*
    c. PACI: pan-resistant *Acinetobacter*
39. Which 3 vaccines contain capsular polysaccharide?
    a. Hib (against *Haemophilus influenzae* type b)
    b. Prevenar / Pneumovax (against 13 / 23 serotypes of *Streptococcus pneumoniae*)
    c. meningococcus vaccines (against serotypes ACWY) – <u>but not B</u>!
40. What kind of specimen can be sent to the microbiological diagnostic laboratory in the case of typical pneumonia?
    a. Sputum and haemoculture
41. What kind of specimen can be sent to the microbiology diagnostic laboratory in the case of atypical pneumonia?
    a. Blood, urine, broncho-alveolar lavage.
42. What kind of bacterial infection can be treated by antitoxin? (2 example)
    a. Infections caused by bacterial exotoxins: tetanus, botulism, diphtheria
43. Which bacteria can be differentiated with the catalase test?

a. Staphylococci (+) and Streptococci (-)

44. Which bacteria can be differentiated with the coagulase test?
    a. *Staphylococcus aureus* (+) and the other staphylococcus species (-, so called „coagulase-negative staphylococci")
45. Microscopic morphology of Staphylococci
    a. Gram-positive cocci, arranged in grape-like structures
46. Colony morphology of *Staphylococcus aureus* on blood agar plate
    a. average size, round colonies with butter consistency, golden pigment production and beta-haemolysis
47. What are the non-toxic virulence factors of *Staphylococcus aureus*? (3 example)
    a. Protein A, endocoagulase (clumping factor), exocoagulase, adhezins, teicoic acid, hialuronidase, protease, lipase, DN-ase.
48. What are the toxic virulence factors of Staphylococcus aureus?
    a. Leucocidin, toxic shock syndrome toxin, exfoliative toxin, enterotoxin, haemolysin
49. Disease caused by *Staphylococcus aureus*?
    a. Folliculitis, furuncle, carbuncle, impetigo, pneumonia, osteomyelitis, food poisoning.
50. Diseases caused by *Staphylococcus aureus* exotoxins? (2 example)
    a. Food poisoning, scalded skin syndrome, toxic shock syndrome
51. List at least 2 coagulase-negative staphylococcus species (from the list provided below)!
    a. *S. epidermidis*, *S. saprophyticus*, *S. haemolyticus*, *S. lugdunensis*
52. Diseases caused by coagulase negative staphylococci?
    a. Nosocomial infections, biofilm production on the surface of plastic devices.
53. Which bacterium can cause „Honeymoon cystitis"?
    a. Staphylococcus saprophyticus
54. Colony morphology of *Streptococcus pyogenes* on blood agar plate
    a. small, pin-point colonies, surrounded by large, strong beta-haemolytic zone
55. Which streptococci show beta-haemolysis?
    a. *Streptococcus pyogenes*, *Streptococcus agalactiae*
56. Which streptococci show alpha-haemolysis?
    a. *Streptococcus pneumoniae* and viridans streptococci (e.g. *S. mutans*, *S. mitis*, *S. salivarius*)
57. Which species is the *Lancefield group A* streptococcus?

a. *Streptococcus pyogenes*

58. Which species is the *Lancefield group B* streptococcus?
    a. *Streptococcus agalactiae*
59. What is the causative agent of scarlet fever?
    a. *Streptococcus pyogenes?*
60. Which bacterial virulence factor is the causative agent of scarlet fever?
    a. Streptococcus pyrogenic exotoxin or erythrogenic toxin
61. What is the capsule of *S. pyogenes* made of?
    a. hyaluronic acid
62. Disease cause by Streptococcus pyogenes? (3 examples)
    a. Pharyngitis, tonsillitis, sinusitis, impetigo, erysipelas, necrotising fasciitis, scarlet fever, TSST
63. What kind of post streptococcal infections can be caused by Streptococcus pyogenes?
    a. Acute rheumatic fever, glomerulonephritis
64. Which two streptococcus species show 100% penicillin sensitivity still now?
    a. *Streptococcus pyogenes and Streptococcus agalactiae*
65. What kind of disease can be caused in new-borns by Streptococcus agalactiae?
    a. In new born meningitis, sepsis, pneumonia.
66. Which bacterium is the leading cause of neonatal meningitis?
    a. *Streptococcus agalactiae*
67. Microscopic morphology of *Streptococcus pneumoniae*
    a. Gram-positive diplococci
68. How can be prevented the invasive diseases caused by Streptococcus pneumoniae?
    a. By 23 valent polysaccharide capsule vaccine or by 13 valent conjugated vaccine.
69. Which two bacteria can be differentiated based on their optochin sensitivity / resistance?
    a. *S. pneumoniae* (S) and viridans streptococci (R)
70. What kind of disease can be cause by viridans group streptococci?
    a. Dental decay or endocarditis.
71. Which are the 2 most frequent human pathogenic Enterococcus species?
    a. *E. faecalis* and *E. faecium*
72. Microscopic morphology of *Neisseria gonorrhoeae*?
    a. Gram-negative, non capsulated diplococci.

73. What kind of culture media can be used to cultivate *Neisseria gonorrhoeae*?
    a. Chocolate agar or Thayer Martin agar.
74. Microscopic morphology of *Neisseria meningitidis*?
    a. Gram-negative, capsulated, diplococci.
75. How can *Neisseria meningitidis* spread ?
    a. By respiratory droplets and will colonize the nasopharynx.
76. What kind of disease can be caused by Neisseria meningitidis?
    a. Sepsis, meningitis, Waterhouse-Friderichsen syndrome.
77. What kind of diseases can be caused by Nesseria gonorrhoeae?
    a. Gonorrhoea, blenorrhoea neonatorum, proctitis, orchitis.
78. What is the causative agent of Waterhouse-Friderichsen syndrome?
    a. Neisseria meningitidis
79. What kind of tests can be performed from liquor in case of *Neisseria meningitidis* infection?
    a. Microscopic examination, Gram-stain, latex agglutination.
80. What can be do prophylactic with the contact person who suffering by *Neisseria meningitidis* infection?
    a. Chemoprophylaxis by rifampicin or ciprofloxacin.
81. What can cause *Nesseria gonorrhoeae* in newborns?
    a. Ophthalmoblenorrhoea neonatorum
82. Which serotype of *Haemophilus influenzae* can cause invasive infection?
    a. The *Haemophilus influenzae* with capsule „b” serotype.
83. How can be prevented the invasive infections caused by *Haemophilus influenzae* strains?
    a. By Hib vaccine
84. What kind of disease can be caused by *Haemophillus ducreyi*?
    a. Ulcus molle (chancroid).
85. What is the causative agent of whooping cough?
    a. *Bordetella pertussis*.
86. What are the virulence factor of Bordetella pertussis? (2 examples)
    a. Fimbria, pertactin, pertussis toxin, tracheal cytotoxin, dermatonecrotic toxin.
87. What is the causative agent of tularemia?
    a. *Francisella tularensis*
88. What are the causative agents of human brucellosis? (2 examples)
    a. Brucella abortus, B. melitensis, B. suis, B. canis

89. What are the diseases caused by *Bacillus anthracis*? (2 examples)
    a. Cutaneous anthrax, pulmonary anthrax, gastrointestinal anthrax.
90. What kind of disease can be caused by *Bacillus cereus*?
    a. Food poisoning (vomiting, diarrhoea), wound infection.
91. What is the causative agent of pseudomembranosus colitist?
    a. Clostridium difficile
92. What kind of bacteria can cause flaccid paralysis?
    a. Clostridium botulinum
93. What kind of bacteria can caused spastic paralysis?
    a. Clostridium tetani
94. What is the treatment of Botulism?
    a. Giving polyvalent antitoxin.
95. What is the treatment of pseudomembranosus colitis?
    a. Vancomycin per os, metronidazole, faecal transplantation.
96. Which bacteria can cause gas gangrene? (2 example)
    a. *Clostridium perfringens, Clostridium histolyticum, Clostridium septicum*.
97. What is the causative agent of diphtheria?
    a. *Corynebacterium diphtheriae*.
98. How can be detected the toxin of *Corynebacterium diphtheriae*?
    a. By Elek's-test, Römer-test (in guinea pig).
99. What is the treatment of diphtheria?
    a. Passive immunisation, giving antibiotics, artificial ventilation if is necessary.
100. Which bacteria belong to diphtheroid group? (2 examples)
    a. Corynebacterium pseudodiphtheriticum, Corynebacterium ulcerans, Corynebacterium minutissimum, Corynebacterium urealyticum.
101. What are the diseases caused by Listeria monocytogenes?
    a. Meningitis, sepsis, granulomatosis infantiseptica.
102. What are the diseases caused by Listeria monocytogenes in adults?
    a. Gastrointestinal symptoms, meningitis, sepsis, endocarditis
103. What is the treatment of Listeriosis?
    a. Ampicillin-gentamicin is the drug of choice.
104. What is the causative agent of erysipeloid?
    a. *Erysipelothrix rhusiopathiae*.
105. Which bacteria can cause dental decay?
    a. Lactobacilli and Streptococcus mutans.

106. Which bacteria can cause human tuberculosis? (3 examples)

a. Mycobacterium tuberculosis, mycobacterium bovis, Mycobacterium africanum.

107. What kind of staining can be used to stain mycobacteria?

a. Ziehl-Neelsen staining.

108. How long can be cultivated the causative agent of human tuberculosis on Lowenstein-Jensen culture media?

a. 6-8 weeks.

109. How can be prevented the human tuberculosis?

a. By BCG vaccine.

110. What are the facultative pathogenic mycobacteria? (2 examples)

a. Mycobacterium avium komplex, Mycobacterium kansasii, Mycobacterium marinum, Mycobacterium ulcerans.

111. Which mycobacteria is apathogenic?

a. Mycobacterium smegmatis.

112. What is the causative agent of leprosy?

a. Mycobacterium leprae.

113. What are the types of leprosy?

a. Tuberculoid and lepromatosus leprosy.

114. What is the treatment of leprosy?

a. Dapson, clofazamin, rifampicin.

115. How can Nocardia stain?

a. It is Gram-positive and Ziehl-Neelsen positive

116. What are the most important Actinomyces species? (1 example)

a. Actinomyces israelii, Actinomyces naeslundii, Actinomyces odontolyticus.

117. Which E. coli can be toxin producer? (3 examples)

a. ETEC, EPEC, EAEC, EIEC, EHEC

118. What kind of extra intestinal disease can be caused by Escherichia coli?

a. Urinary tract infections, neonatal meningitis, sepsis.

119. What are the causative agent of typhoid fever? (4 examples)

a. Salmonella Typhi and Salmonella Paratyphi A, B, C.

120. Which bacteria can cause salmonellosis?

a. Salmonella Enteritidis, Salmonella Typhimurium, Salmonella Choleraesuis

121. What is the causative agent of dysentery? (2 examples)

a. *Shigella dysenteriae, Shigella flexneri, Shigella sonnei*.

122. Which bacterium is the causative agent of plague?

a. Yersinia pestis.

123. What is the spreading way of the plague?

a. By the bite of the rat flea, by respiratory droplets.

124. What are the diseases caused by Klebsiella pneumoniae?

a. Lobar (Friedländer) pneumonia, wound infection, bloodstream infection, urinary tract infection.

125. What is the causative agent of cholera?

a. Vibrio cholerae

126. What kind of Vibrio species can cause human diseases? (3 examples)

a. *Vibrio cholera, Vibrio parahaemolyticus, Vibrio vulnificus*.

127. What are the characteristic biochemical properties of Pseudomonas aeruginosa?

a. Obligate aerobic, oxidase positive.

128. Colony morphology of Pseudomonas aeruginosa?

a. Bacteria can produce water-soluble pigment that stain the culture media, the colonies have grape like smells.

129. Microscopic morphology of Pseudomonas aeruginosa?

a. Gram-negative rod.

130. What are the most frequent diseases caused by Pseudomas aeruginosa?

a. Nosocomial lung infections, wound and blood stream infections.

131. What is the treatment of the diseases cause by Pseudomonas aeruginosa?

a. Multiresistant, based on antibiogram.

132. What is the most common source of the infection caused by Acinetobacter baumanii?

a. Hospital environment.

133. What does MACI mean in microbiology?

a. Multiresistant *Acinetobacter baumannii*

134. What is the most common source of the infection caused by *Stenotrophomonas maltophila*?

a. Nosocomial lung infection, sepsis.

135. What is characteristic for antibiotic sensitivity of *Stenotrophomonas maltophila*?

a. Multiresistant.

136. How can Legionella pneumophila spread?

a. By aerosol.

137. What is the diagnosis of Legionellosis?

a. By serology from blood, by immune chromatography from urine.

138. Which bacterium can cause chronic gastritis or stomach ulcer?

a. Helicobacter pylori.

139. What is the most important cultivable anaerobic member of the normal flora of the large bowel?

a. Bacteroides fragilis.

140. Which genera belongs to the Spirochaetales order?

a. Treponema, Borrelia, Leptospira.

141. What are the causative agents of Plaut-vincent angina?

a. Treponema vincentii and Fusobacteria.

142. What is the causative agent of syphilis?

a. Treponema pallidum subspecies pallidum

143. How can syphilis spread?

a. By sexual contact, transplacental, by blood transfusion and by organ transplantation.

144. What is the first symptom in syphilis?

a. Ulcus durum – painless hard ulcer, enlarged lymph nodes.

145. In which stage of the syphilis can appear rush all over the body?

a. 2^{nd} stage.

146. In which stages is syphilis contagious?

a. 1^{st} and 2^{nd} stages and in the first 2 years of the latency. At 3^{rd} stage only in utero infections may occure.

147. When can develop neurosyphilis during the infection?

a. In all stages of the diseases can develop neuroyphilis.

148. What is the specific diagnosis of the syphilis?

a. ELISA, TPHA, TPPA

149. When can be used non treponemal serological reactions during the infection?

a. RPR and VDRL is used to determine the stages of syphilis

b. To detect the reinfection

c. To control the effectiveness of the therapy

150. What are the non-specific treponemal serological reactions?

a. RPR and VDRL

151. What kind of diseases can be caused by Borrelia?

a. Lyme diseases and relapsing fever

152. How can the Lyme disease spread?

a. By the bite of thick.

153. What are the causative agents of Lyme disease? (2 examples)

a. Borrelia burgdorferi, Borrelia afzelli, Borrelia garini

154. What is the causative of epidemic relapsing fever?

a. *Borellia recurrentis*.

155. What is the vector of Lyme diseases?

a. Tick

156. What is the vector of *Borrelia recurrentis*?

a. Body louse

157. What is the molecular background of relapsing fever?

a. Bacterial antigen changing.

158. What is the first symptom of Lyme diseases?

a. Erythema chronicum migrans

159. What is the causative agent of Weil's diseases?

a. Leptospira icterohaemorrhagiae.

160. What are the characteristic properties of the meningitis caused by Leptospira?

a. Serosus, non-purulent.

161. What is the source of the infection caused by Leptospira?

a. Zoonotic diseases, can spread by the urine of animals.

162. How can the Lyme diseases diagnosed?

a. By serology, ELISA screening test and fro confirmation immunoblot is used.

163. Which bacteria cannot have cell wall?

a. Mycoplasma, Ureaplasma.

164. Which bacteria can cause atypical pneumoniae?

a. *Mycoplasma pneumoniae, Chlamydophila pneumoniae, Legionella pneumophila*.

165. What is the causative agent of typhus exanthematicus?

a. *Rickettsia prowaczekii*

166. What is the causative agent of Q-fever?

a. Coxiella burnettii

167. What is the causative agent of parrot fever?

a. *Chlamydophila psittaci*.

168. What is the causative agent of trachoma?

    a. *Chlamydia trachomatis*, serotype A-C.

169. What kind of disease can be caused by Chlamydia trachomatis serotype L1-L3?

    a. Lymphogranuloma venereum.

170. What is the effect of the bacterial AB exotoxins?

    a. They are: neurotoxins, protein synthesis inhibitors or ion secretion enhancers.

171. What is the effect of the cholera toxin?

    a. Increasing of the cAMP, enhancing the ion secretion

172. What are the causative agents of impetigo contagiosa?

    a. S.aureus, S.pyogenes

173. *What is the causative agent of erysipelas?*

    a. Streptococcus pyogenes

174. What is the causative agent of Trachoma*?*

    a. Chlamydia trachomatis A,B,C

175. *What is the causative agent of Ophtalmoblenorrhoea neonatorum?*

    a. Neisseria gonorrhoeae

176. List 4 capsulated bacteria from the list below!

    a. Streptococcus pneumoniae, Streptococcus agalactiae, Streptococcus pyogenes, Escherichia coli, Haemophilus influenzae, Neisseria meningitidis, Listeria monocytogenes

177. How many percentage of the adults are carrier of *Staphylococcus. aureus*?

    a. 20-30%

178. How many different kind (serotype) of capsule can be produced by Streptococcus pneumoniae?

    a. 94 (accepted answer: 90-100)

179. What is the most common causative agent of community acquired pneumonia?

    a. Streptococcus pneumoniae

180. What kind of vaccines can be used to prevent invasive diseases caused by Streptococcus pneumoniae

    a. Prevenar-13: *Streptococcus pneumoniae* 13 type of capsule conjugated to toxoid – recommended for new-borns and in elderly

    b. Pneumovax: *Streptococcus pneumoniae* 23 type of capsule – recommended for adults and teenagers.

Mycology

1. What are the fungal cell components (3example)?
    a. Cytoplasmic membrane with ergosterin, cell wall build up by chitin, glucan, or cellulose.
2. Classification the fungi by morphology?
    a. Unicellular or yeast, multicellular or mould and dimorphic
3. Characterisation of the dimorphic fungus
    a. They grow like moulds at room temperature and grow like yeast at body temperature.
4. List at least two asexual spore type.
    a. Blastopore, conidia, arthrospore, spherule.
5. What is the cultivation temperature of the fungi?
    a. 25°C and 37°C to detect the dimorphism.
6. What kind of culture media can be used to cultivate fungi?
    a. Sabouraud culture media.
7. What are the content (2 example) of Sabouraud culture media?
    a. Antifungal agents against environmental moulds, carbohydrates, antibiotics.
8. What kind of diseases can be caused by fungi?
    a. Allergic reactions, intoxications, mycosis (tissue damage of fungi).
9. Classification of the mycosis?
    a. Superficial, cutaneous, subcutaneous, systemic, and opportunistic mycosis.
10. What kind of staining can be used in mycology? (2 example)
    a. Gram-, methylene blue-, India ink-, PAS-, Gömöri-Grocott staining.
11. Mode of action of the antifungal drugs?
    a. Inhibition of ergosterin synthesis, pore formation on membrane, inhibition of nucleic acid synthesis, inhibition of cell division
12. List three causative agent of systemic mycosis.
    a. Coccidioides immitis, Histoplasma capsulatum, Blastomyces dermatitidis, Paracoccidoides immitis
13. List two Candida species.
    a. *Candida albicans, C. tropicalis, C. krusei, C. glabrata, C. parapsilosis*.
14. List three causative agent of opportunistic mycosis.
    a. *Candida sp, Cryptococcus neoformans, Pneumocystis jirovecii, Aspergillus sp., Penicillium sp., Mucor sp., Rhizopus sp*.
15. Which fungus can cause subcutaneous mycosis?
    a. Sporothrix shenkii
16. What is the most common causative agent of superficial mycosis?
    a. Malassezia furfur
17. List two causative agent of dermatomycosis.

    a. *Trichopyton sp., Microsporum sp., Epidermophyton sp.*

18. What kind of diseases can be caused by dermatophytes? (3 example)?
    a. Tinea pedis, T. manus, T. capitis, T. corporis, T. faciei, T barbae.
19. Lit two 2 *Trichophyton* species.
    a. *Trichphyton rubrum, T. schonleinii, T. tonsurans, T. verrucosum*
20. What are the source of the infection caused by dermatophytes?
    a. Anthropophilic – human, geophilic – soil, zoophilic – animal

Protozoology

1. What are the development stages of the protozoa?
    a. Trophozoit and cyst
2. What are the properties of the trophozoit?
    a. Can move, feed, multiply and die
3. What are the properties of the cyst?
    a. Is responsible for surviving in unfavourable environment, not showing biochemical activity is a dormant structure
4. How can the protozoa be classified?
    a. By the type of movement: amoeba, ciliate, flagellate and sporozoa
5. List two amoebas.
    a. *Entamoaeba sp., Acantamoeba sp., Naegleria sp*.
6. What is the causative agent of amoebic dysentery?
    a. Entamoeba histolytica
7. What can *Entamoeba histolytica* cause?
    a. amoebic dysentery, liver, lung and brain abscess
8. What is the causative agent of primary amoebic meningoencephalitis?
    a. *Naegleria fowleri*.
9. What is the causative agent of amoebic keratitis?
    a. *Acanthamoeba castellani*.
10. Which protozoa can cause steatorrhea?
    a. Giardia lamblia
11. What is the treatment of giardiasis?
    a. Metronidazole
12. Which protozoon can cause prostatitis?
    a. Trichomonas vaginalis
13. Which protozoon can spread by sexual contact?
    a. Trichomonas vaginalis
14. Which protozoa can spread by the bite of sand fly?
    a. *Leishmania* sp.
15. What kind of disease can be caused by *Leishmania* sp.?
    a. Cutan, mucocutan and visceral leishmaniosis
16. How can leishmaniosis diagnose?
    a. Giemsa-staining of biopsied material
17. Treatment of leishmaniosis?
    a. stibogluconate in combination with g-IFN and amphotericin-B
18. What are the causative agent of Human African Trypanosomiasis (sleeping sickness)?
    a. Trypanosoma brucei gambiense, Trypanosoma brucei rhodensiense
19. How can the sleeping sickness spread?
    a. By the bite of tsetse fly
20. What are the symptoms of sleeping sickness?
    a. lethargy, meningoencephalitis, dementia, somnolence, coma
21. What is the treatment of sleeping sickness?

a. Suramin, melarsoprol

22. What is the causative agent of Chagas diseases?
    a. *Trypansoma cruzi*
23. How can spread the Chagas disease?
    a. By the faeces of the kissing bug during the bite
24. What is the treatment of Chagas disease?
    a. Nifurtimox, the chronic stage is untreatable
25. What kind of diseases can be caused by *Cryptosporidium parvum*?
    a. watery diarrhoea which lasts to 1-2 week
26. What is the treatment of cryptosporidiosis?
    a. Oral rehydration
27. What is the final host of *Toxoplasma gondii*?
    a. Cats
28. In which population can *Toxoplasma* cause serious disease?
    a. In pregnant women and in immunocompromised population
29. What is the treatment of toxoplasmosis?
    a. Spiramycin, pyrimethamine combined with sulphonamide
30. How can malaria spread?
    a. By the bite of Anopheles mosquito, transpalcental and by transfusion
31. What are the symptoms of malaria (4 symptoms)?
    a. periodic high fever, chills, head ache pain in joints and muscle, anaemia, hepato and splenomegaly, kidney failure
32. How can malaria diagnose?
    a. blood: thick droplet, thin film stained by Giemsa, IF, PCR
33. What is the treatment of malaria?
    a. chloroquine, mefloquine and artemisin, hypnozoites by primaquine
34. Prevention of malaria by chemoprophylaxis?
    a. chloroquine, mefloquine, doxycycline
35. Prevention of malaria by vaccine?
    a. Available vaccine since 2018 against *Plasmodium falciparum*. The content of the vaccine is a fusion protein.
36. How can *Balantidium coli* spread?
    a. By fruits, vegetable contaminated by pig manure or by faecal oral route
37. What are the symptoms of balantidiasis?
    a. dysentery with abdominal pain, tenesmus
38. Treatment of balantidiasis?
    a. metronidazole, tetracycline

Helminths

1. Classification of the helminths by morphology?
    a. Flatworms: flukes and tapeworms; roundworms
2. What are the most characteristic properties of the flukes (3 example)?
    a. they are short, flat, leaf shaped, hermaphrodites, do developed digestive system
3. What is the most common intermediate host of the flukes?
    a. water snail
4. What is the causative agent of fascioliasis?
    a. *Fasciola hepatica*
5. What is the treatment of fascioliasis?

a. bithionol or triclabendazole

6. What is the causative agent of the lung fluke disease?
    a. *Paragonimus westermani*
7. What are the symptoms of paragonimiasis?
    a. night sweats, fever, bloody sputum, chest pain, pleuritis, bronchopneumonia
8. What is the treatment of paragonimiasis?
    a. praziquantel or bithionol
9. What are the blood flukes?
    a. *Schistosoma mansoni, S. japonicum, S. haematobium*
10. Which flukes can live in the intestinal venules?
    a. *Schistosoma mansoni* and *Schistosoma japonicum*
11. Which fluke can live in the bladder venules?
    a. *Schistosoma haematobium*
12. What is the treatment of schstosomiasis?
    a. praziquantel
13. What is the intermediate host of *Taenia saginata*?
    a. cattle
14. What is the intermediate host of *Taenia solium*?
    a. pig
15. What kind of human diseases cab be caused by *Taenia solium*? (2 example)
    a. tape worm infection and, cysticercus cellulosae
16. What is the treatment of taeniasis?
    a. Niclosamide, mebendazole
17. What is the causative agent of fish tapeworm disease?
    a. *Diphyllobothrium latum*
18. What is the treatment of diphyllobothriasis?
    a. Niclosamide
19. Which vitamin deficiency can cause by *Diphyllobothrium latum*?
    a. The lack of B12 vitamin
20. How can *Hymenolepis nana* infection treated?
    a. Niclosamide
21. Which helminths can develop hydatid cysts?
    a. *Echinococcus granulosus* and *Echinococcus multilocularis*
22. How can the hydatid cysts treated?
    a. By albendazole or surgical removing
23. Which helminth can cause itchiness in anus?
    a. *Enterobius vermicularis*

24. How can be treated the infection caused by *Enterobius vermicularis*?
    a. By mebendazole
25. How can be diagnosed the infection caused by *Enterobius vermicularis*?
    a. by sticky tape or Scotch tape
26. Which helminth can cause diarrhoea by prolapses of rectum?
    a. Trichuris trichiura
27. Which helminth can cause protein deficiency (Kwashiorkor syndrome)?
    a. Ascaris lumbricoides
28. Which helminths can suck blood?
    a. Ancylostoma duodenale, Necator americanus
29. What is the treatment of the infection caused by *Ancylostoma* and *Necator*?
    a. mebendazole, albendazole
30. Which helminth can cause paralytic ileus?
    a. Strongyloides stercoralis
31. What kind of human disease can be caused by *Toxocara canis*?
    a. visceral larva migrans and ocular larva migrans syndrome
32. What kind of specimen can be used to diagnose the Toxocara infection?
    a. Blood for serology
33. What kind of helminthic infection can spread from carnivore animals to humans?
    a. Trichinella spiralis
34. What is the diagnosis of trichinellosis?
    a. Serology from blood
35. What is the treatment of the Trichinella infection?
    a. mebendazole, albendazole and can acts only on intestinal helminths
36. What is the causative agent of lymphatic filariasis, elephantiasis?
    a. Wuchereria bancrofti
37. How can elephantiasis spread?
    a. By mosquito bite
38. What is the treatment of filariasis?
    a. diethylcarbamazin
39. Which helminth can appear in subconjunctival region?
    a. Loa-loa
40. Which helminth can cause river blindness and elephant skin?
    a. Onchocerca volvulus

Virology

1. What kind of disease can be caused by adenoviruses (3 examples)?

    a. pharyngitis, pneumonia, pertussis syndrome, pharyngoconjuctival fever, acute haemorrhagic cystitis, gastroenteritis
2. How can parvoviruses spread?
    a. by respiratory droplets
3. What kind of disease can be caused by parvoviruses (3 examples)?
    a. erythema infectiosum, hydrops fetalis, aplastic anaemia
4. What kind of diseases can be caused by high-risk group papillomaviruses?
    a. cervix cancer, tumour in oral cavity
5. What kind of diseases can be caused by low-risk group papillomaviruses?
    a. condyloma acuminatum, warts
6. What can JC and BK viruses cause? (1 example)
    a. JC: progressive multifocal leucopathia (PML); BK: haemorrhagic cystitis and nephropathy
7. What can HHV1 (Herpes simplex virus 1) cause?
    a. herpes labialis, herpes simplex dermatitis, eczema herpeticum, herpes gladiatorum, herpetic whitlow
8. What can HHV2 (Herpes simplex virus 2) cause?
    a. herpes genitalis, neonatal herpes, encephalitis
9. How can HHV1 and HHV2 infections treated?
    a. by acyclovir
10. What can VZV (Varicella Zooster virus) cause?
    a. chickenpox and shingles
11. How can chickenpox prevented?
    a. By vaccine (live attenuated)
12. What can EBV (Epstein-Barr virus) cause?
    a. mononucleosis infectiosa, Burkitt lymphoma, nasopharingeal carcinoma, oral hairy leucoplakia
13. What can CMV (Cytomegalovirus) cause?
    a. hepatitis, pancreatitis, pneumonitis, nephritis, myocarditis, encephalitis, chorioretinitis, oesophagitis, colitis, congenital infections
14. What can HHV-6 cause?
    a. encephalitis, pneumonitis, chorioretinitis, exanthema subitum or roseola infantum
15. What can HHV-7 cause?
    a. encephalitis, flaccid paralysis, hepatitis, gastritis, lymphadenopathy, diarrhoea, pityriasis rosea
16. What can HHV-8 cause?
    a. Kaposi-sarcoma, lymphoma

17. How can Hepatitis B virus spread?
    a. by parenteral way, by sexual contact or perinatal
18. How can Hepatitis B virus infection treated?
    a. by interferon, by nucleotide analogues
19. How can Molluscum contagiosum virus spread and what can cause?
    a. by direct contact and cause benign tumour of the skin
20. What can Poliovirus cause?
    a. aseptic meningitis, poliomyelitis, post-polio syndrome
21. What can Coxsackie A and B viruses cause?
    a. A: herpangina, hand-foot-mouth disease, acute haemorrhagic conjunctivitis
       B: pleurodynia or Bronholm disease, myocarditis, pancreatitis
22. What can Rhinoviruses cause?
    a. sore throat, running nose, coughing
23. How can Hepatitis A virus spread?
    a. by faecal oral rout, by contaminated food, by contaminated water
24. How can Caliciviruses spread and what can cause?
    a. by faecal oral rout, by contaminated water, by aerosol. Can cause diarrhoea vomiting.
25. Hon can Rotaviruses spread and what can cause?
    a. by faecal oral rout and can cause diarrhoea and vomiting
26. How can Hepatitis E virus spread and what can cause?
    a. by contaminated water, by raw pig and boar meat, rarely by blood transfusion and transplacental. Can cause acute hepatitis.
27. How can spread the causative agent of yellow fever?
    a. by mosquito bite from human to human or from monkey to human.
28. How can Hepatitis C virus spread?
    a. by parenteral way, by blood, by tattooing
29. Which population is at risk during the Rubella virus infection?
    a. pregnant women because can cause in utero infections (congenital rubella syndrome)
30. How can Influenza viruses spread and what can cause (3 examples)?
    a. By respiratory droplets. Symptoms: high fever, fatigue, muscle pain, head ache, sometimes-gastrointestinal symptoms.
31. How can Morbillivirus spread and what can cause?
    a. by respiratory droplets and can cause measles with exanthemas and Koplic spots.
32. What kind of complication may develop during measles?
    a. pneumonia, encephalitis and SSPE: subacute sclerotizing panencephalitis
33. How can Mumpsvirus spread and what are the symptoms?
    a. by respiratory droplets. Symptoms are: inflammation of salivary gland, pancreatitis, orchitis, deafness
34. What is the causative agent of rabies?
    a. Lyssa virus.
35. How can rabies prevented?

a. by vaccine administered post exposure

36. What is the treatment of HIV infection?
    a. By combination of nucleotide analogue and protease inhibitors
37. How can HTLV-1 spread?
    a. by sexual contact, by blood and transplacental or by breast-feeding
38. How can Dengue-fever virus spread?
    a. by mosquito bite.
39. List two members of Flaviviruses.
    a. Yellow-fever virus, Dengue-fever virus, tick born encephalitis virus, Zika-virus.
40. What does arbovirus mean?
    a. arthropod born viruses.
41. List two diseases caused by prions
    a. kuru, fatal familiar insomnia, Creutzfeldt–Jacob-syndrome, bovine spongiform encephalitis