



KENYATTA UNIVERSITY

**EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE AND
BACHELOR OF SURGERY (MBChB Level II)**

HPA I: PATHOLOGY 1 PAPER II: MULTIPLE CHOICE QUESTIONS

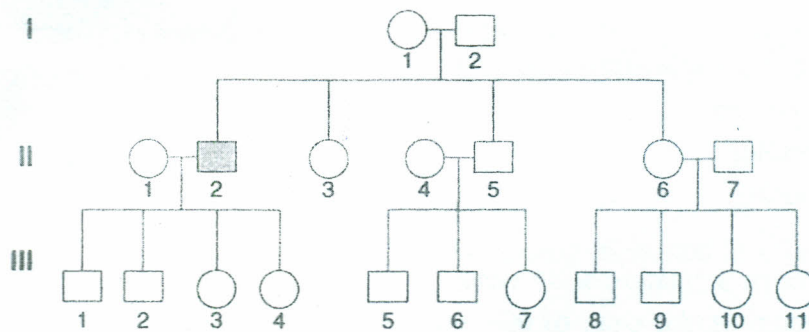
3RD TRIMESTER 2021/2022

TIME: 3 HOURS

INSTRUCTIONS:

- This paper consists of 100 multiple questions.
 - Each question carries one mark.
 - Answer all the questions in the booklet provided.
1. The following are major functional characteristics of innate immunity except:
 - a. Killing invading micro-organisms.
 - b. Eliminating damaged host cells.
 - c. Activating the acquired immune mechanisms.
 - d. Complicating tissue repair in injured hosts.
 2. The cells that produce IL-3 and GM-CSF in the ontogeny of monocytes to support effective functional maturation are:
 - a. Thymocytes
 - b. Stromal cells
 - c. Dendritic cells
 - d. Antigen presenting cells
 3. In the process of antibody-dependent cellular cytotoxicity:
 - a. Antibody – coated targeted are destroyed by killer cells
 - b. Antibody acts antagonistically to killer cells
 - c. Cytotoxicity is mediated by antibody independent killer cells
 - d. Phagocytosis by receptor-independent cells is greatly enhanced
 4. The name given to the condition arising from a failed expression of the signal that directs leucocytes to the injury site in a host is:
 - a. Tay-Sachs Disease
 - b. Chemotaxis
 - c. Leucocyte adhesion deficiency
 - d. Adrenoleukodystrophy

5. An example of a first messenger in signal transduction among cells of the immune system is a :
 - a. Cell division
 - b. Growth factor
 - c. Movement
 - d. Secretion
6. One of the followings is an example of a cytokine produced by T_H1 cells which activates macrophages to enhance their ability to destroy intracellular pathogens:
 - a. Interferon-gamma
 - b. Interferon-alpha
 - c. Interleukin-one
 - d. Interleukin-six
7. One of the following cytokines would show a pleiotropic property in a host infection with a fungal agent:
 - a. $TNF-\beta$
 - b. $IFN-\gamma$
 - c. IL-5
 - d. IL-4
8. In a secondary antibody response to a helminthic infection, the most important reason for a shorter lag phase is that the:
 - a. Plasma cells have undergone senescence and died off
 - b. Memory cells proliferate rapidly to increase the intensity of the response
 - c. Effector antibodies have been depleted at the initiation of the response
 - d. Increased half-life of plasma cells supports continuous antibody production
9. A cutaneous basophil hypersensitivity response in an immune host can be:
 - a. Blocked by treatment with a specific anti-basophil antiserum
 - b. Enhanced by injection of a polyclonal anti-basophil antibody
 - c. Blocked by injecting antihistamines
 - d. Enhanced by injection of antihistamines directly into damaged sites
10. A number of human protozoan parasites of public health importance owe their successful life to a combination of the following host immune evasion strategies EXCEPT:
 - a. Antigenic variation to hoodwink host immune attack
 - b. Immunosuppression of host responses
 - c. Direct transmission to the final host
 - d. Intracellular habitat in the definitive host
11. Individual II-2 in the associated pedigree was diagnosed with haemophilia A. One of the following individuals would be most at risk for also developing haemophilia A



- II-3
 - II-6
 - III-3
 - III-8
12. A young boy is being evaluated for developmental delay, mild autism, and mental retardation. Physical examination reveals the boy to have large, everted ears and a long face with a large mandible. He is also found to have macroorchidism, and extensive workup reveals multiple tandem repeats of the nucleotide sequence CGG in his DNA. One of the following is the most likely diagnosis
- Fragile X syndrome
 - Huntington's chorea
 - Myotonic dystrophy
 - Ataxia-telangiectasia
13. Type IV Ehlers-Danlos syndrome is made is disorder that results from abnormalities involving the structural protein type III collagen. One of the following is the correct type of inheritance pattern shown by this disorder
- Autosomal dominant
 - Autosomal recessive
 - Mitochondrial
 - X-linked dominant
14. A 22-year-old woman in the second month of her first pregnancy presents with lower abdominal pain and vaginal bleeding. Histologic examination of blood clots taken from the vaginal vault reveals decidualized tissue and occasional chorionic villi. Chromosomal analysis of these products of conception from her spontaneous abortion reveals a triploid karyotype. One of the following is the total number of chromosomes present in this abnormal karyotype
- 23
 - 46
 - 47
 - 69
15. The major pathway of ethanol metabolism in the liver is via
- Alcohol dehydrogenase in the SER
 - Microsomal P-450
 - Catalase in the peroxisomes
 - Oxidative pathway

16. Lead poisoning produces the following change in red blood cells:
- Pappenheimer bodies
 - Howell-Jolly bodies
 - Basophilic stippling
 - Heinz bodies
17. A 3-month-old infant born premature at 35 weeks of gestation is being evaluated for ocular problems and seizures. An x-ray of this infant's head reveals extensive cerebral calcification in the periventricular areas. Because of this combination of clinical signs, the possibility of congenital toxoplasmosis is considered. Elevated levels (titres) of one of the following types of antibodies, if directed against *Toxoplasma gondii*, would best support this diagnosis
- IgG
 - IgM
 - IgD
 - IgA
18. One of the listed receptors on leukocytes binds to pathogen-associated molecular patterns (PAMPs) and mediates the innate immune response to bacterial lipopolysaccharide
- G-protein-coupled receptor
 - Mannose receptor
 - Opsonin receptor
 - Toll-like receptor
19. One of the following types of leukocytes actively participates in acute inflammatory processes and contains myeloperoxidase within its primary (azurophilic) granules and alkaline phosphatase in its secondary granules
- Neutrophils
 - Eosinophils
 - Monocytes
 - Lymphocytes
20. One of the following best explains why the third hypervariable region in an immunoglobulin molecule has the greatest variability
- Multiple germline gene segments
 - Somatic hypermutation
 - Addition N and P nucleotides
 - Combinatorial association of light and heavy chains
21. One of the following mechanisms is responsible for production of membrane-bound or secreted form of an immunoglobulin molecule:
- Junctional diversity
 - Differential RNA splicing
 - Allelic exclusion
 - Class switching

22. RhoGAM (anti-Rh antibodies) blocks one of the following anti-D antibody isotopes:
- IgM
 - IgD
 - IgE
 - IgG
23. The following cytokine is characteristically produced in a TH1 response:
- IL-2
 - IL-4
 - IL-5
 - IL-10
24. The role played by Major Histocompatibility Complex 1 and 2:
- Transduce the signal to T cells following antigen recognition
 - Mediate immunogenic class switching
 - Present antigens for recognition by T cell antigen receptors
 - Enhance the secretion of cytokines
25. One of the following is TRUE of negative selection in T cell development
- Deletion of cells that fail to express T cell receptor
 - Death due to weak recognition of self MHC
 - Death due to strong affinity for self-antigens
 - Apoptosis due to failure to recognize self MHC
26. One of the following does not happen during the sensitization phase in type 1 hypersensitivity
- Allergen enters through the mucous membrane and are picked up by a dendritic cell
 - Allergen attaches IgE on mast cells and triggers degranulation
 - Synthesis of IgE specific to allergen
 - IgE molecules bind with their Fc fragments to mast cell receptors
27. The immune system cells that are not found at the maternal-foetal interface are:
- Uterine Natural Killer cells
 - Neutrophils
 - Macrophages
 - T cells
28. The antibody generated against the intrinsic factor in the gastric tissue leads to one of the following
- Goodpasture syndrome
 - Pernicious anemia
 - Celiac disease
 - Peptic ulcers
29. One of the following is not a strategy for inducing tolerance:
- Engaging inhibitory receptors
 - Treg targeted therapies
 - Administration of antigen in tolerogenic form
 - Antigen-specific lymphocyte cell transfers

30. One of the following statements is not true about DiGeorge Syndrome
- Primarily involves humoral immunity
 - Symptoms occurs within the first 24 hrs of life.
 - It is also known as 22q11.2 deletion syndrome
 - Recurrent infections begin soon after birth
31. Pigs or dogs are the sources of human infection by each of the following parasites except:
- Echinococcus granulosus*
 - Taenia solium*
 - Taenia saginata*
 - Trichinella spiralis*
32. Each of the following statements concerning malaria is correct except
- The female *Anopheles* mosquito is the vector
 - Early infection, sporozoites enter hepatocytes
 - Release of merozoites from red blood cells causes fever and chills
 - The principal site of gametocyte formation is the human gastrointestinal tract.
33. Each of the following statements concerning *Trichomonas vaginalis* is correct except:
- Trichomonas vaginalis* is transmitted sexually
 - Trichomonas vaginalis* can be diagnosed by visualizing the trophozoite
 - Trichomonas vaginalis* can be treated effectively with metronidazole
 - Trichomonas vaginalis* causes bloody diarrhea
34. *Leishmania donovani* can be cultured on
- Ma Conkey agar
 - NNN
 - Diamonds media
 - CLED media
35. *Trypanosoma cruzi* is transmitted by:
- Tse Tse fly
 - Blackfly
 - Sandfly
 - Reduviid bug
36. The commonest cause of the malaria in the world is
- Plasmodium falciparum*
 - Plasmodium vivax*
 - Plasmodium knowlesi*
 - Plasmodium malariae*
37. Ciliate dysentery is caused by:
- Entamoeba histolytica*
 - Balantidium coli*
 - Giardia intestinalis*
 - Trichomonas hominis*

38. The most common site for lodging of *Giardia lamblia* is in:
- Colon
 - Duodenum
 - Caecum
 - Rectum
39. The stage responsible for relapse in malaria is:
- Pre erythrocytic stage
 - Exo erythrocytic stage
 - Sporozoite
 - Gametocyte
40. One of the following diseases is caused by a metazoan parasite
- Giardiasis
 - Filariasis
 - Trichomoniasis
 - Toxoplasmosis
41. The main anatomic location of *Schistosoma mansoni* adult worms is:
- Renal plexus
 - Intestinal venules
 - Lung alveoli
 - Bone marrow
42. Each of the following parasites is transmitted by eating inadequately cooked fish or seafood except:
- Diphyllobothrium latum*
 - Ancylostoma duodenale*
 - Clonorchis sinensis*
 - Paragonimus westermani*
43. The skin test used for the diagnosis of hydatid cyst is known as:
- Casoni test
 - Schick test
 - Montenegro test
 - Dick test
44. Each of the following parasites is transmitted by flies except
- Onchocerca volvulus*
 - Trypanosoma gambiense*
 - Schistosoma mansoni*
 - Loa loa*
45. A 72-year-old Chinese man presented with fatigue, abdominal discomfort, anorexia, weight loss of 6 kg, and diarrhea for 2 months. Stool microscopy for ova, cysts and parasites: scanty oval eggs, $30 \times 15 \mu\text{m}$, with a terminal spine seen. The malignancy associated with this infection is:
- Cholangiocarcinoma
 - Gastric carcinoma
 - Gastrointestinal stromal tumor
 - Hepatocellular carcinoma

46. The parasite completing entire life cycle in one host is
- Ascaris*
 - Anylostoma*
 - Strongyloides*
 - Trichiuris*
47. Each of the following statements concerning trichinosis is correct except:
- Trichinosis can be diagnosed by seeing cysts in muscle biopsy specimens
 - Trichinosis is acquired by eating undercooked pork
 - Eosinophilia is a prominent finding
 - Trichinosis is caused by a protozoan that has both a trophozoite and a cyst stage in its life cycle
48. Each of the following parasites passes through the lung during human infection except:
- Wuchereria bancrofti*
 - Ascaris lumbricoides*
 - Strongyloides stercoralis*
 - Necator americanus*
49. 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. One of the following is the best method to make that diagnosis
- Determine the titer of IgE antibody against the organism
 - Examine transparent adhesive tape for the presence of eggs
 - Examine the stool for the presence of cysts
 - Examine the stool for the presence of trophozoites
50. A 13-year-old boy 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. The likely cause is:
- Enterobius vermicularis*
 - Trichuris trichiura*
 - Echinococcus granulosus*
 - Ascaris lumbricoides*
51. One of the following is a malignant tumor of epithelial origin
- Lymphoma
 - Carcinoma
 - Sarcoma
 - Papilloma
52. One of the following statements is true of hyperplasia
- The adaptive response is always pathologic
 - The adaptive process may occur in skeletal muscle
 - Occurs in cells capable of DNA synthesis
 - Results into increase in size of individual cells

53. The enzyme involved in generation of oxygen free radicals is:
- Xanthine oxidase
 - Catalase
 - Glutathione peroxide
 - Superoxide dismutase
54. Cell swelling following hypoxic cell injury is due to:
- Increased intercellular lipids
 - Increased intracellular glycogen
 - Increased intracellular proteins
 - Increased intracellular water
55. The mechanism of oedema in congestive heart failure is:
- Decreased plasma oncotic pressure
 - Endothelial injury
 - Increased hydrostatic pressure
 - Lymphatic obstruction
56. One of the following refers to minute (1-2mm) hemorrhage in mucus membrane
- Haematoma
 - Petechiae
 - Purpura
 - Ecchymoses
57. Hemorrhagic infarct tends to occur in one of the following organs
- Lung
 - Spleen
 - Kidney
 - Heart
58. Adenocarcinoma is a:
- Carcinoma developing from mesenchymal tissue
 - Carcinoma arising from simple squamous epithelium
 - Carcinoma arising from glandular epithelium
 - Undifferentiated carcinoma.
59. One of the following statements is true
- Malignant tumours are always undifferentiated
 - The rate of growth is always constant for benign tumours
 - Tissue invasion is a good criterion of differentiating benign from malignant neoplasms
 - Benign tumours may have the capacity to metastasize
60. One of the following is a cause of exudative oedema
- Acute inflammation
 - Increased plasma oncotic pressure
 - Congestive heart failure
 - Sodium retention

61. The feature that is most likely to be present in microbes that produce golden beta-hemolytic colonies is:
- Bacitracin sensitivity
 - Catalase negativity
 - Coagulase positivity
 - Streptokinase positivity
62. One of the following is not a general disease associated with *Streptococcus pneumoniae*
- Pneumonia
 - Meningitis
 - Tonsillitis
 - Sinusitis
63. Reddening of meat in Robertson's cooked meat broth is produced by
- Clostridium tetani*
 - Clostridium histolyticum*
 - Clostridium perfringens*
 - Clostridium sporogenes*
64. Clue cells are seen in:
- Bacterial vaginosis
 - Vaginal candidiasis
 - Trichomoniasis
 - Chlamydial infection
65. McFaydeans reaction is employed for the presumptive diagnosis of
- Anthrax
 - Tetanus
 - Typhoid
 - Brucellosis
66. Among the serogroups of *Neisseria meningitidis* given, one of these is the most important associated with meningococcal infection
- A, B, C, Y and W135
 - A, B, C, X, Y, and W135
 - A, B, C, X, Y, and W125
 - A, B, C, X and W135
67. One of the following is not the general characteristic of the HACEK organisms
- Normal flora of the oral cavity
 - Require CO₂ for growth
 - Grow well on MacConkey agar
 - Causative agents of infectious endocarditis
68. *P. aeruginosa* is becoming more resistant to antibiotics over the years. Select an important drug used in the treatment of urinary tract infections caused by the bacteria
- Azithromycin
 - Ciprofloxacin
 - Amoxicillin
 - Vancomycin

69. A premature male newborn baby born with low birth weight had a breathing problem and flu-like symptoms, he was immediately admitted to the NICU. Blood specimen was taken for laboratory examination, microscopic examination showed gram-negative bacilli, routine culture was done and non-hemolytic colonies appeared on the plate after a few days of incubation. Name the possible pathogen.
- a. *Escherichia coli*
 - b. *Klebsiella pneumoniae*
 - c. *Haemophilus influenzae*
 - d. *Legionella pneumophila*
70. Following a backpacking trip in Vermont, a hiker experienced flulike symptoms and noticed a round, red rash on her thigh. The likely cause of her illness is
- a. *Brucella melitensis*
 - b. *Borrelia burgdorferi*
 - c. *Francisella tularensis*
 - d. *Yersinia pestis*
71. Urease helps in the production of ulcers by *H. pylori* by
- a. Increasing acid production by cells lining the stomach
 - b. Neutralizing acid produced by cells lining the stomach
 - c. Degrading mucus-producing cells
 - d. Preventing destruction of *H. pylori* following phagocytosis
72. Diffusion and dilution tests that expose pathogens to antimicrobials are designed to
- a. Determine the spectrum of action of a drug
 - b. Determine which drug is most effective against a particular pathogen
 - c. Determine the mode of action of a drug
 - d. Determine the resistance mechanism of a drug
73. One of the following statements explains the mode of action of sulfonamides
- a. Sulfonamides attach to sterol lipids in the pathogen, disrupt the membranes, and lyse the cells
 - b. Sulfonamides prevent the incorporation of amino acids into polypeptide chains
 - c. Humans and microbes use PABA differently in their metabolism
 - d. Sulfonamides inhibit DNA replication in both pathogens and human cells
74. An elderly 78-year-old diabetic male visited the hospital with pain in the lower abdomen and groin. When examined, he had a fever, prostatitis was suspected, and he was immediately admitted. The symptoms got worse with recurrent urinary infections. After a week of observation, a urine sample taken for the culture showed gram-negative and highly motile colonies, with no color change in the CLED culture media. The predominant pathogen is:
- a. *Klebsiella pneumoniae*
 - b. *Escherichia coli*
 - c. *Pseudomonas aeruginosa*
 - d. *Proteus mirabilis*

75. One of the following statements regarding 'pyuria' of the urinary tract is false
- Longer use of catheters can lead to sterile pyuria
 - Detection of white blood cells in the urine sample
 - Pyuria is associated with nonpulmonary tuberculosis
 - Chlamydial infection is the only cause of a pyuria
76. A newborn with an underdeveloped lung had to stay in hospital for a prolonged period. She developed a serious respiratory infection associated with central line-associated bloodstream infection (CLABSI). One of the following pathogens is commonly associated with CLABSI
- Mycoplasma pneumonia*
 - Coagulase negative *Staphylococci*
 - Streptococcus pyogenes*
 - Clostridium perfringens*
77. All the following statements regarding *Mycoplasma pneumonia* are true except
- It lacks a cell membrane
 - It is a causative agent of "atypical pneumonia" in humans
 - It is pleomorphic and the smallest free-living microorganism
 - It can't be cultivated in regular nutrient agar media
78. A 50-year-old patient who had his kidney transplant 6 months ago visited the hospital with pneumonia-like symptoms for the last 2 months. The chest x-ray examination revealed a typical feature of tuberculosis infection, a photochromogenic (orange pigment when exposed to UV light) acid-fast rod bacterium was isolated from the sputum sample. The identified bacteria is:
- Mycobacterium avium*
 - Mycobacterium tuberculosis*
 - Mycobacterium kansasii*
 - Mycobacterium leprae*
79. One of the following pathogens is associated with the disease 'reiter's syndrome'
- Chlamydia trachomatis*
 - Staphylococcus aureus*
 - Ureaplasma urealyticum*
 - Mycoplasma pneumoniae*
80. The serological test mostly preferred for the positive diagnosis of the *Rickettsia rickettsii* from skin biopsy specimens of a rash is
- Complement fixation test
 - Indirect Immunofluorescence technique
 - Schick skin test
 - Agglutination test
81. Killing of bacterial spores can be accomplished using all of the following methods except:
- Moist heat at 121°C at 15 psi for 15 minutes
 - Pasteurization at 72°C for 30 seconds
 - Moist heat at 132°C for 1 hour
 - Dry heat at 180°C for 3 hours

82. A urine specimen was collected at 8.00 a.m. The nurse labeled the sample and placed it next to the tube station to be sent to the laboratory for testing. The specimen was received in the laboratory for culture at 4.00 p.m. on the same day. The microbiologist in the laboratory should:
- Discard the specimen
 - Call the nurse to explain why the specimen was rejected and request a new sample
 - Quickly set up a routine bacteriology culture
 - Set up a routine bacteriology culture and note the time
83. One of the following statements about viruses and bacteria is accurate:
- Viruses do not have mitochondria whereas bacteria do
 - Viruses do not have ribosomes whereas bacteria do
 - Viruses are prokaryotic whereas bacteria are eukaryotic
 - Viruses replicate by binary fission whereas bacteria replicate by mitosis
84. One of the following is not a benefit of human normal microbial flora:
- Competing with and prevent pathogens from colonizing the host
 - Depressing the immunity of the host
 - Helping maintain the vaginal acidity during the child bearing age
 - Producing and secreting vitamins B and K
85. The resolution power of an ordinary bright-field light microscope is:
- 0.1 mm
 - 0.1 μm
 - 1.0 mm
 - 1.0 μm
86. The nature and composition of bacterial capsules:
- Are responsible widespread blood clotting during infection
 - Allow phagocytes to readily engulf the bacteria
 - Have no effect on the virulence of the bacteria
 - Affect the virulence of the bacteria
87. The dimorphic fungi grow as yeast forms at which temperature
- 25° C
 - 20° C
 - 37° C
 - 44° C
88. One of the following is not an example of superficial fungal infections:
- Pityriasis versicolor
 - Seborrheic dermatitis
 - Malassezia folliculitis
 - Mycetoma
89. Fungi that predominantly invade skin, hair and nails are classified as:
- Superficial
 - Cutaneous
 - Subcutaneous
 - Systemic

90. A middle-aged woman pricked her finger two months ago while pruning some rose bushes and developed a local pustule that progressed to an ulcer. Several nodules then developed along the local lymphatic drainage. The most likely causative agent is:
- Aspergillus fumigatus*
 - Candida albicans*
 - Cryptococcus neoformans*
 - Sporothrix schenckii*
91. This virus is not presently circulating in the human population
- A H1N1
 - B. H2N2
 - C. H3N2
 - D. H1N2
92. This statement is correct with regards to most DNA viruses:
- Single-stranded genome
 - Enveloped
 - Icosahedral symmetry
 - Use host tRNA as a primer for genome replication
93. The first step upon release of coronavirus genome into the host cell is:
- Translation of the incoming RNA segment into protein
 - Copying of the positive strand of each genome into a negative strand
 - Copying of the negative strand of each segment into an mRNA
 - Capping of the positive strand of each genome segment
94. The role of polypurine tract in retrovirus replication is to
- Serves as template for positive strand synthesis
 - Endonuclease activity of the RNA:DNA hybrid
 - Serves as a primer for positive strand synthesis
 - Serves as a terminator for the positive strand synthesis
95. One of the following is a type of immunoglobulin molecules that is produced months after a viral infection.
- IgA
 - IgD
 - IgG
 - IgM
96. Tests samples for monkey pox can be obtained from the following except
- Serum
 - Semen
 - Scabs
 - Saliva
97. Guillain Barre syndrome is a neurologic manifestation that is mainly associated with the following virus
- Human Immunodeficiency Virus
 - Hepatitis B Virus
 - ZIKA
 - Human cytomegalovirus

98. One of the following immune cells is targeted by the Human Cytomegalovirus
- a. T cells
 - b. Monocytes
 - c. Macrophages
 - d. Dendritic cells
99. One of the following statements is incorrect with regards to the pathogenesis of simian immunodeficiency virus.
- a. The virus is less virulent in chimps when compared to HIV in humans
 - b. It is pathogenic in chimps like AIDS is in humans
 - c. Transmission rates per coital act is similar to HIV in humans
 - d. Has close sequence similarities to HIV
100. One of the following is the leading cause of viral-induced cirrhosis
- a. Yellow fever
 - b. Hepatitis A
 - c. Herpes simplex 2 virus
 - d. Hepatitis C