



Tanta University

Faculty of Medicine

Microbiology & Immunology Department

2nd Paper Master Degree in Microbiology & Immunology

Course title: Microbiology & Immunology

Date: 8/6/2021

Time: 3 H

Total Assessment Marks: 360 marks

A-IMMUNOLOGY (90 marks)

Q1-Give an account on: 10 marks each

- 1-Activation and mechanism of action of T helper cell.**
- 2-Clinically important type I hypersensitivity reaction.**
- 3- Humoral immune response**
- 4-Mechanisms of graft rejections**

Q2-Discuss The Following: 5 marks each

- 1-Etiology of autoimmune diseases**
- 2- Antifungal immunity**

Q3-Mention the followings: 10marks each

- 1-different complement pathways**
- 2-activation and mechanism of action of T cytotoxic cell**

Q4-discuss immunodeficiency disorders 10 marks

Q5- Enumerate the following: 5 marks each

1- Bacterial vaccines

2-Live attenuated vaccines

B- Systemic Bacteriology: (135marks)

Q1-A 19-month-old child is brought to the emergency room following a seizure. His mother says he had a common cold for 2 or 3 days but today he became worse. On examination his temperature is 38.1C, he not responds to your voice but withdraw his extremities from painful stimuli. He grimaces when you try to bend his neck. His white blood cell count is $\geq 1000-2000$ cells/mcL mainly neutropils, and CT scan of his head is normal. You perform a lumbar puncture, which reveals numerous small gram-negative coccobacilli that grows only on Chocolate agar (Total 25 marks)

- A. What is the diagnosis of such condition and explain why this diagnosis? (2 marks)
- B. List the common organisms for such condition? And enumerate the name of mentioned one in the case? (4marks total)
- C. As regard the mentioned organism discuss the following: (12 marks)
 - I. Its pathogenesis? (5 marks)
 - II. Laboratory diagnosis? (5 marks)
 - III. Treatment? (2 marks)
- D. Enumerate vaccines for **two of the** most common aetiologic organisms of such condition? (7 marks)

Q2-Explain the main virulence factor(s) responsible for the pathogenesis of the following diseases? (Total 25 marks)

1. Meningococcal meningitis (5 marks)
2. Anthrax(6marks)
3. Antibiotic-associated pseudomembranous colitis (5 marks)

4. *Listeria monocytogenes* meningitis (6 marks)
5. *Helicobacter peptic ulcer*(3marks)

Q3- For each of the following virulence factors, enumerate : One organism possessing it, its importance in its pathogenesis, One important disease caused by the organism. (Total 15 marks, 5 marks each)

- a) Protein A
- b) M protein
- c) Yops(*Yersenia* outer proteins)

Q4-Enumerate the causative organism and mode of transmission, laboratory diagnosis and treatment of each of the following: (Total 50 marks, 10 marks each)

- a) Relapsing fever
- b) Actinomycosis
- c) Trachoma
- d) Undulant fever
- e) Q fever

Q5 -55-year-old man who just arrived from Germany experiences attacks of bloody diarrhea and abdominal cramps. He states that he had a hamburger sandwich with green salad. Culture of stools on MacConkey's medium reveals a pure culture of rose-pink colonies. Examination of Gram-stained film from these colonies shows Gram-negative bacilli. (Total 10 marks)

- a) Enumerate the possible causative organism of this condition? (2 marks)
- b) Enumerate the virulence factor and explain its role in pathogenesis of this organism? (3 marks)
- c) Outline the diagnosis steps for such condition? (3 marks)
- d) Enumerate the most serious complication of this condition and explain its pathogenesis? (2 marks)

Q6-Compare between: Active and Latent Tb (10 marks)

C-Virology

(110 marks)

(10 questions, 11 marks each) total of 110 marks

- 1) Enumerate the indicators of Tissue Culture contamination
- 2) Define conditional lethal mutants and their application
- 3) Describe the non-permissive cells for viral replication.
- 4) Discuss dideoxy-inosine regarding mechanism of action, use and side effects.
- 5) In a table form describe the properties of different viruses in herpetovirus group regarding main diagnostic test, site of latency and treatment.
- 6) Mention the human representatives for papova virus group and the relation of different HPV serotypes to clinical conditions.
- 7) Enumerate 3 different types of Covid 19 vaccines and describe one of them.
- 8) A 10 month- aged infant has developed pneumonia during winter after being hospitalized for a surgery. Tissue culture for viral diagnosis revealed cytopathogenic effect in the form of Giant cells and syncytia. Answer the following:
 - * What is the most expected virus causing this condition?
 - * What is the mechanism of giant cell foimation by the virus?
 - * Which part of the virus produces neutralizing antibodies?
 - * Enumerate its serologic types?
 - * How to prevent?
- 9) Mention the commonest 2 viral causes for aseptic meningitis, what is the method of infection and diagnosis of them.
- 10) In a table form, mention the serologic test results in different clinical stages of HBV infection.

D-Mycology

(25 marks)

Q1-A 42-years-old woman with chronic asthma presents for evaluation of a cough. She has had severe asthma for most of her life and currently uses both

inhaled and oral corticosteroids. While in the process of tapering down her dose of oral steroids, she developed a productive cough of brown mucous. Her temperature is 38C. A chest x-ray shows a lobular infiltrate. A complete blood count shows a white blood cell count 11,000/cmm with 10 % eosinophils microscopic examination for her sputum is notable for the presence of numerous eosinophils.(Total 15 marks)

1. Enumerate diagnosis of such condition, the causative organism and why ? (4 marks)
2. Enumerate the mode of transmission of the causative organism?(2 marks)
3. Outline the laboratory diagnosis steps of such condition? (3 marks)
4. List other clinical conditions caused by the causative organism? (3 marks)
5. Outline the treatment options of such disease? (3 marks)

Q2- As regards Mucormycosis (Total 10 marks)

1. Enumerate mode of transmission? (one mark)
2. Enumerate the common species? one mark)
3. Explain its pathogenesis?(2 marks)
4. Enumerate susceptible patients? (2 marks)
5. Explain causes of its appearance in COVID-19 patients? (2 marks)
6. Outline the steps of its treatment? (2 marks)

Best Wishes

يعقد الامتحان العملى بقسم الميكروبيولوجى من ٢٠-٢٣/٦/٢٠٢١
و الشفوى يوم ٢٣/٦/٢٠٢١

رئيس القسم

أ.د/محمد زكريا حسين



Examination for Master Degree in Microbiology and Immunology:
Course Title: Microbiology and Immunology
Date: 1 / 6 / 2021
Term: paper I
Time Allowed: 3 hours
Total Assessment Marks: 180 marks
Number of the questions: 10



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All the questions should be answered:

- Q1: Discuss in details the STRUCTURE and FUNCTION of:** (10 marks each)
- a) Bacterial cytoplasmic membrane with special reference to mesosomes.
 - b) Transposons.
- Q2: Outline the MECHANISM of ACTION of:** (10 marks each)
- a) Bacterial mutation.
 - b) Multi-drug resistant efflux pumps.
- Q3: Write a short note on TYPES of:** (10 marks each)
- a) Bacterial nutritional groups.
 - b) Non-genetic antimicrobial resistance.
 - c) Molecular cloning vectors.
 - d) Carriers.
- Q4: Discuss** the process of T cell maturation. (15 marks)
- Q5: Mention the similarities and differences between:** MHC-I and MHC-II molecules. (10 marks)
- Q6: Compare between:** T-cell Ag receptor (TCR) and B-cell Ag receptor (BCR). (10 marks)
- Q7: Enumerate:** Cells of the innate immunity and explain the functions of one of them. (10 marks)
- Q8: Give an account on:**
- a) Ligase chain reaction: principle and example. (7 marks)
 - b) Filter hybridization: principle and advantages (you can use diagrammatic format). (10 marks)
- Q9: Schedule** the vaccines important for health-care workers and recommended doses. (18 marks)
- Q10: Describe** the transmission-based precautions for varicella. (20 marks)

Good Luck

Head of Department
Prof. Mohamed Zakaria Hussein

