



UNIVERSITY OF THE PUNJAB

Second Prof. A/2015

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology

TIME ALLOWED: 3 hrs.

PAPER: 4

MAX. MARKS: 100

Instructions: Attempt any FIVE questions. Question No.1 is COMPULSORY.
Illustrate your answer with Diagrams and Examples where necessary. All questions carry equal marks.

Q. No. 1 Objective Type

(A) Define the following terms:

05

1. Immunity
2. Microbiology
3. Disinfection
4. Synthetic media
5. Tyndallization

(B) Multiple Choice Questions (MCQs)

08

1. The nucleic acid of a virus is
 - a) DNA only
 - b) RNA only
 - c) Either DNA or RNA
2. Drinking water utilities monitor their production system for the occurrence of
 - a) Methonogens
 - b) Yeasts
 - c) Coliform bacteria
3. Which of the following is considered as a greenhouse gas
 - a) CH₄
 - b) N₂O
 - c) Both a & b
4. Moniliasis is caused by _____
 - a) Candida albicans
 - b) Blastomyces brasiliensis
 - c) Coccidioides immitis
5. The most fatal species of Plasmodium causing Malaria is _____
 - a) Vivax
 - b) Malariae
 - c) Falciparum
6. The Medium used for the growth of Fungi is known as _____
 - a) Sodium Thioglycollate Agar
 - b) Sabouraud's Dextrose Agar
 - c) Nutrient Agar

P.T.O.

7. Gram Staining Method was developed in the year
 - a) 1888
 - b) 1886
 - c) 1884
8. Generation time of Mycobacterium tuberculosis is
 - a) 12.5 minutes
 - b) 23 minutes
 - c) 13 hours

(C) Fill in the following statements

1. AIDS stands for _____
2. Lysozyme was discovered by _____
3. Bacillary dysentery is caused by the _____
4. TAB vaccine is prepared by _____
5. Black colored pigment is produced by bacterium known as _____
6. The Vibrio cholerae has _____ separate chromosomes
7. Cold-burs is caused by _____

07

Q No. 2 Differentiate the following:

- a) Precipitation and agglutination OR Immunology and Immunity
- b) Specific and non specific resistance
- c) Eukaryotes and Prokaryotes

07

07

06

Q No. 3 Discuss Unitarian concept of antibodies. Describe living, dead and attenuated Vaccines.

20

Q No. 4 a) Explain in detail the fermentation process with some examples in pharmacy.

10

b) What is cold sterilization? Describe in detail various methods for cold sterilization.

10

Q No. 5 a) What is Hypersensitivity? Discuss its types in detail.

13

b) What do you mean by immunological disorders?

7

Q No. 6 a) Describe a few important pharmaceutical products of microbial origin.

10

b) Describe Growth Characteristics. Draw and discuss Growth Curve.

10

Q No. 7 Write short notes on any **FOUR** of the followings:

20

- i. A Guide to Current GMP
- ii. Structure of Peptidoglycan
- iii. Lifecycle of Bacteriophage
- iv. Growth Factors
- v. Characteristics of a Living Cell

UNIVERSITY OF THE PUNJAB



Second Prof. A/2016
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology
Pharmaceutics-III (Pharmaceutical Microbiology &
Immunology
PAPER: 4 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

Instructions: Attempt any FIVE questions. Question No.1 is **COMPULSORY**.
Illustrate your answer with Diagrams and Examples where necessary. All
questions carry equal marks.

Q. No. 1	Define the following terms:	05
(A)	1. Immunology 2. Epidemic disease 3. Vaccine 4. Virus 5. Nosocomial infection	
(B)	Multiple Choice Questions (MCQs)	08
1	The Ig that mediates allergic reaction is a) Ig D b) Ig E c) Ig A	
2	All of the following comes under nonspecific defense mechanism except a) Fever b) Cell mediated immunity c) Complement system	
3	DNA vaccine elicit protective immunity against a microbial pathogen by activating a) Humoral immune system b) Cellular immune system c) Both a & b	
4	Antibodies are a) Proteins b) Glycoproteins c) carbohydrates	
5	The most common class of antibody involved in Type II hypersensitivity is a) Ig G b) Ig M c) Ig E	
6	Antigen binding site on an antibody is called a) Antitope b) Epitope c) Paratope	
7	In an immune response the type of cells which gets activated earliest is a) Helper T cells b) Plasma cells c) Cytotoxic T cells	

P.T.O.

	8	Antibody dependent cytotoxicity is associated with a) Type I b) Type II c) Type IV	
(C)		Fill in the following statements	07
	1	A defense process in which body's white blood cells engulf and destroy microorganisms is called _____.	
	2	The ability of a lens system to transmit light without variation and permit nearby objects to be clearly distinguished is called _____.	
	3	_____ is a preparation of modified microorganisms treated toxins or parts of microorganisms used for immunization process.	
	4	The existence of microorganisms was first reported in late 1660's by _____.	
	5	A highly resistant oval body formed by certain types of bacteria are called _____.	
	6	The doctrine that held that lifeless objects give rise to living organisms is _____.	
	7	_____ is an accumulation of one type of microorganisms formed by the growth of colonies of that microorganism.	
Question No. 2		What you understand by cell-mediated immunity. Discuss in detail.	20
Question No. 3		Write note on the following a) Antigens b) Dengue Fever	20
Question No. 4		Define virus, parts of virus, its replication and cultivation.	20
Question No. 5	a)	Discuss the structure of bacteria with the help of diagram and explain their functions in maintaining the bacterial cell growth.	10
	b)	Write a note on spontaneous generation.	10
Question No. 6		Define Hypersensitivity, list its types and discuss Type I and Type II in detail.	20
Question No. 7	a)	What is a Nosocomial infection and compromised host. How it is transmitted n discuss control of this infection.	15
	b)	Enlist Koch's postulates.	05



UNIVERSITY OF THE PUNJAB

Second Prof. 2nd A/2016

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology

Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

PAPER: 4 (Old & New Course)

Instructions: Attempt any FIVE questions. Question No.1 is COMPULSORY. Illustrate your answer with Diagrams and Examples where necessary. All questions carry equal marks.

Q. No. 1 Define the following terms;

05

(A)

1. Resolution
2. Microbiology
3. Acute disease
4. Pandemic disease
5. Syndrome

(B)

Multiple Choice Questions (MCQs)

08

- 1 The nucleic acid of a virus is
 - a) DNA only
 - b) RNA only
 - c) either DNA or RNA
- 2 Allergy to sea food and eggs etc is an example of hypersensitivity
 - a) Type I
 - b) Type II
 - c) Type IV
- 3 Which of the following is considered as a greenhouse gas
 - a) CH₄
 - b) N₂O
 - c) Both a & b
- 4 Light chains and heavy chains are joined by a
 - a) covalent bond
 - b) hydrogen bond
 - c) disulphide bond
- 5 Fc region is involved in
 - a) Cell surface receptor binding
 - b) Complement activation
 - c) Both a & b
- 6 The most effective Ig is
 - a) Ig G
 - b) Ig M
 - c) Ig A
- 7 Small chemical groups on the antigen molecule that can react with antibody is
 - a) Epitope
 - b) isotope
 - c) Allotope

P.T.O.

- 8 Which of the following immune mechanism is responsible for protecting us from diseases of other species?
- Active immunity
 - Innate immunity
 - adaptive immunity

(C) Fill in the following statements

07

- Robert Hook published his major work in 1665 called _____.
- _____ is an infectious disease spread by an altered chemical quality of the atmosphere.
- _____ is an infection that passes from one thing to another.
- Germ theory of disease was suggested by _____.
- A visible mass of microorganisms usually of a single type is called _____.
- _____ is a partial antigen that complexes to carrier proteins or polysaccharides to form a complete antigen.
- _____ is an infectious particle composed of nucleic acid and protein that replicates within living cells.

Question No. 2	Define antibodies and discuss its structures, types and antigen-antibody interactions.	20
Question No. 3	Write note on a) Phagocytosis b) Golden age of microbiology	20
Question No. 4	a) Discuss the different components of bacterial structure with the help of diagram. b) Write a note on Rabies.	10 10
Question No.5	Discuss Serological reactions in detail.	20
Question No. 6	a) Define Disease and discuss development of disease. b) Define Resistance and discuss non-specific Resistance in detail.	10 10
Question No. 7	Define humoral immunity and discuss in detail.	20



UNIVERSITY OF THE PUNJAB

Second Prof: A/2017

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology

Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

PAPER: 4 (Old & New Course)

Attempt any FIVE questions. Question No 1 is compulsory. Illustrate your answer with Diagrams and Examples where necessary. All questions carry equal marks.

Q. No. 1 Define the following terms: 05

- (A)
1. Sterilization
 2. Disinfection
 3. Antiseptic
 4. Germicide
 5. Fermentation

(B) Multiple Choice Questions (MCQs) 08

- 1 Iodine used in Gram's staining serves as
 - a) Catalyst
 - b) Cofactor
 - c) Mordant
- 2 Surface appendage of bacteria meant for cell-cell attachment during conjugation is
 - a) Pilli
 - b) Flagella
 - c) Cilia
- 3 The circulation of two month old breast-fed baby will contain maternal
 - a) Ig A
 - b) Ig E
 - c) Ig G
- 4 Which type of hypersensitivity cannot be transferred with serum antibody
 - a) Type I
 - b) Type III
 - c) Type IV
- 5 BCG vaccine is used to protect against
 - a) Influenza
 - b) Rabies
 - c) Tuberculosis
- 6 Primary immunodeficiency producing susceptibility to infection by virus & molds is due to the deficiency of
 - a) B cells
 - b) T cells
 - c) Phagocytes
- 7 Temperature in Pasteurization is
 - a) 62.8°C
 - b) 68.2°C
 - c) 60.8°C

P.T.O.

- 8 Separation of a single bacterial colony is called
 a) Pure Culturing
 b) Isolation
 c) Both

(C) Fill in the following statements

07

- 1 The splitting of a parent bacterial cell to form a pair of similar size daughter cells is known as _____.
- 2 _____ is a measure of the growth rate of microbial population.
- 3 _____ is a chemical that kills or prevent infection without damaging living tissues.
- 4 The site of T cells maturation is _____.
- 5 _____ is the small chemical group on antigen molecule that reacts with antibodies.
- 6 _____ is involved in mediating allergic reactions.
- 7 T helper cell mediated hypersensitivity is _____ hypersensitivity.

Question No. 2	Classify various methods of sterilization. Give details of cold sterilization procedure.	20
Question No. 3	Write note on the following a) Industrial Hygiene b) Microbial growth	20
Question No. 4	Write a comprehensive note on non-specific resistance.	20
Question No. 5	a) Discuss the classification of bacteria in detail.	10
	b) Give the importance of soil microbiology. Explain in detail Nitrogen Cycle.	10
Question No. 6	Define Serology and discuss different serological reactions.	20
Question No. 7	a) Discuss what are Antigens? Define different types of antigens.	10
	b) Define immunity and discuss its types in detail	10



UNIVERSITY OF THE PUNJAB

Second Prof: 2nd Annual - 2017
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology

Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

PAPER: 4 (Old & New Course)

Instructions: Attempt any FIVE questions. Question No.1 is COMPULSORY.

Illustrate your answer with Diagrams and Examples where necessary.

All questions carry equal marks.

Q. No. 1 Define the following terms: 05

- (A)
1. Fermentation
 2. Autoclaving
 3. D-Value
 4. Z-Value
 5. Absolute Sterilization

(B) Multiple Choice Questions (MCQs) 08

- 1 Type IV hypersensitivity is often referred as
 - a) Immediate
 - b) Delayed
 - c) Anaphylactic
- 2 The inability to distinguish between self-cells and non-self cells may lead to
 - a) Hypersensitivity
 - b) Immunodeficiency
 - c) Auto-immune disease
- 3 Majority of the auto-immune diseases are
 - a) Cell mediated
 - b) Antibody mediated
 - c) Mast cell mediated
- 4 Which of the following immunoglobulin is involved in mediating allergic reactions
 - a) Ig E
 - b) Ig G
 - c) Ig A
- 5 The major chemical messenger involved in hypersensitivity is
 - a) Histamines
 - b) Lymphokines
 - c) Inter-leukines
- 6 Bacteria normally contain their genome in
 - a) Plasmid
 - b) Nucleoid region
 - c) Pilus
- 7 Small chemical groups on the antigen molecule that can react with antibody is
 - a) Epitope
 - b) Paratope
 - c) Allotope

P.T.O.

- 8 All of the following diseases are caused by bacteria except
 a) Yellow fever
 b) Typhoid
 c) Cholera

07

(C) Fill in the following statements

- 1 Type II hypersensitivity is triggered by _____.
- 2 Allergies to sea food, eggs etc is an example of _____ hypersensitivity.
- 3 Fab stands for _____.
- 4 The ability of antigen to stimulate antibody production is called _____.
- 5 Any substance or molecule that interact with antibodies are called _____.
- 6 A molecule that reacts with specific antibody but is not immunogenic by itself is called _____.
- 7 The process of weakening a pathogen is called _____.

Question No. 2 What are antibodies? Discuss its types, structures and importance.

20

Question No. 3 Write note on
 a) Hospital Hygiene
 b) Difference between Gram -ve and Gram +ve bacteria

20

Question No. 4 a) What is heat sterilization? Describe in detail various methods of heat sterilization.
 b) Write a note on Bird Flu.

10

10

20

Question No. 5 Discuss immune disorders reactions in detail.

10

Question No. 6 a) What is Fermentation? Explain in detail process of fermentation with some examples in pharmacy.
 b) Define Resistance and discuss non-specific Resistance in detail.

10

20

Question No. 7 a) Write a comprehensive note on Cell-mediated Immunity.



UNIVERSITY OF THE PUNJAB

Second Prof: Annual – 2018
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutical Microbiology (Old Course)
 PAPER: 4

TIME ALLOWED: 3 Hrs.
 MAX. MARKS: 100

Attempt this Paper on Separate Answer Sheet provided.

Attempt any Five questions. Each question carry equal marks.

- Q.1. a). Discuss the classification of bacteria in detail. (10)
- b). Discuss membrane bound organelles of eukaryotic cells. (10)
- Q.2. Define Sterilization. Briefly explain various methods of sterilization. (20)
- Q.3. What is the importance of Industrial microbiology. Describe the production of penicillins. (20)
- Q.4. a). Define protozoa and describe basic characteristics of protozoa. (10)
- b). Explain microbial growth and factors affecting microbial growth. (10)
- Q.5. a). Enumerate the importance of soil microbiology. Explain in detail Nitrogen cycle. (10)
- b). Define virus and classify by nature of genome. (10)
- Q.6. a). What are Antigens. Define types of antigens. (10)
- b). What are Antibodies. Discuss their structure, types and role. (10)
- Q.7. Write notes on the following: (7+7+6)
- a). Factory Hygiene
- b). Hypersensitivity and Allergy
- c). Vaccination



UNIVERSITY OF THE PUNJAB

Second Prof: 2nd Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutics-III (Pharmaceutical Microbiology & Immunology) (New Course)

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 80

PAPER: 4 Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

NOTE: ATTEMPT ANY FOUR QUESTIONS. EACH QUESTION CARRIES EQUAL MARKS.

- Q.2. a). Draw bacterial structure and discuss in detail the structure external to cell wall? (10)
- b). Discuss bacterial growth curve and nutritional factor affecting the bacterial growth curve? (10)
- Q.3. Write note on techniques for cultivating and identifying animal virus. (20)
- Q.4. Define SARS? Its etiology, diagnosis, cure and methods of prevention? (20)
- Q.5. Discuss the etiology, manifestation and treatment of following URTI
- 1) Sinusitis (10)
 - 2) Acute otitis media (10)
- Q.6. a). Why Industrial Hygiene is important? (05)
- b). Discuss control of microbial contamination during manufacture (15)
- Q.7. Give brief answers of the followings: (5 marks each)
- i) Type-II hypersensitivity reactions
 - ii) Dry heat sterilization
 - iii) Types of antibodies
 - iv) Factors affecting the choice of disinfectants



UNIVERSITY OF THE PUNJAB

Second Prof: 2nd Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. in Fig.

Roll No. in Words.

**Subject: Pharmaceutics-III (Pharmaceutical
Microbiology & Immunology) (New Course)**

MAX. TIME: 30 Min.

MAX. MARKS: 20

PAPER: 4 Part – I (Compulsory)

.....
Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

Q.1. Select the most appropriate answer.

1. Who isolated bacteria in pure culture for the 1st time?
 - a) Robert Koch
 - b) Walter Reed
 - c) Joseph Lister
 - d) None of these
2. Name the scientist who pursued the hobby of lens grinding and Microscope making and accurately reported microorganisms.
 - a) Robert Hooke
 - b) Antony van Leeuwenhoek
 - c) Anton von Plenciz
 - d) None of these
3. Temperature required for Pasteurization of liquids, especially Milk, is;
 - a) 62.8°C for in 30 min
 - b) 63.8°C for in 30 min
 - c) 65.0°C for in 30 min
 - d) 64.8°C for in 30 min
4. Ecological characteristics of Microorganisms include;
 - a) Habitat and distribution of microbes
 - b) Interaction between and among species in natural environments
 - c) Both 'a' & 'b'
 - d) None of these
5. The process of examining bacterial cells combined with labeled antibodies is called;
 - a) Immunofluorescence
 - b) Fluorescent antibody technique
 - c) Both a & b
 - d) None of these
6. Cluster of polar flagella is called
 - a) Petritrichous
 - b) Monotrichous
 - c) Lophotrichous
 - d) All of these
7. Genetic system is located in prokaryotes in
 - a) Chromatin
 - b) Nuclear material
 - c) Nucleoid
 - d) All of these
8. The cocci which form a bunch and irregular pattern;
 - a) Diplococci
 - b) Staphylococci
 - c) Streptococci
 - d) Tetrads
9. Depending upon the source of energy utilized, bacteria can be classified as
 - a) Phototrophs
 - b) Chemotrophs
 - c) Both a and b
 - d) None of these
10. Which of the following pair of diseases is caused by virus
 - a) Rabies, Measles
 - b) Typhoid, Tetanus
 - c) Cholera, Tb
 - d) AIDS, Syphilis

P.T.O.

11. In gaseous sterilization with ethylene oxide, it is used
- Alone or in combination with formaldehyde
 - At the concentration of 37% W/V
 - In combination with CO₂
 - In combination with O₂
12. Sub-unit vaccines contain
- Killed organism
 - Inactivated organism
 - Attenuated organism
 - Any part of organism
13. Blood transfusion reactions are ----- type of hypersensitivity
- Immune complex
 - Cytotoxic
 - Cellular
 - Anaphylaxis
14. In sterilization, Z-value represents the
- Temperature at which 90% of viable cells are killed
 - Increase in temperature at which 90% of viable cells are killed
 - Time taken to kill 90% of viable cells
 - Radiation exposure to kill 90% of viable cells
15. Moist heat sterilization applies ----- temperature at reduced pressure as compared with dry heat sterilization
- Higher
 - Lower
 - Same
 - Very high
16. Core nucleic acid called -----
- Capsid
 - Genome
 - Envelope
 - None of above
17. Pneumotropic bacteria affects the
- Respiratory system
 - Skin
 - Blood and visceral organs
 - None of the above
18. Replication of bacteriophage include steps
- Attachment, penetration, biosynthesis, maturation, release
 - Attachment, penetration, breakdown, release
 - Attachment, breakdown, biosynthesis, release
 - None of the above
19. Bacteriophage-typing is used as a laboratory procedure for identification and detection of
- Bacteria
 - Virus
 - Protozoa
 - None of these
20. Tyndallization is also known as
- Fractional sterilization
 - Discontinuous heating
 - Both a and b
 - none of these



UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) Second Prof: Annual-2019

Subject: Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

PAPER: 4 Part - I (Compulsory) (New Course)

Time: 30 Min. Marks: 20

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the correct option.

(20x1=20)

- i. Which statement is NOT true for an oral product? An oral product:
a) is safe for administration b) is not sterile
c) is not pyrogen free d) may contain pathogenic bacteria
- ii. The process is NOT sterilization where the microorganisms in a product are:
a) destroyed b) inhibited
c) removed d) reduced to safer levels
- iii. The physical methods for sterilization are the following EXCEPT:
a) gamma irradiation b) filtration
c) gas d) steam
- iv. The condition for moist-heat sterilization is:
a) 134°C for 10 min b) 115 °C for 30 min
c) 121°C for 15 min d) both A and C
- v. Place the following in the order in which they are found in a host cell: 1) capsid protein
2) infective phage particles 3) phage nucleic acid
a) 1,2,3 b) 3,2,1
c) 2,1,3 d) 3,1,2
- vi. Which of the following terms is the most specific?
a) bacillus b) Bacillus
c) gram-positive d) anaerobic
- vii. Which of the following is not a characteristic of biofilm?
a) antibiotic resistance b) hydrogel
c) iron deficiency d) quorum sensing
- viii. Which one of the following temperatures would most likely kill a mesophile?
a) -50°C b) 0°C
c) 9°C d) 60°C
- ix. Candida albicans causes
a) systemic mycoses b) subcutaneous mycoses
c) cutaneous mycosis d) superficial mycoses
- x. Mycobacterium is an:
a) obligate aerobe b) facultative anaerobe
c) capnophile d) obligate anaerobe
- xi. Small infectious particle that replicates only in living cell is called
a) bacteria b) spirochete
c) viruses d) rods

P.T.O.

- xii. Which of the following is the scientific name?
 a) mycobacterium tuberculosis b) tubercle bacillus
 c) tuberculosis d) mycobacterium
- xiii. If a microorganism is capable of causing disease microorganism is called
 a) virulence b) pathogen
 c) opportunists d) causative agents
- xiv. The cell wall of algae is made up of
 a) glycan b) chitin
 c) glycoprotein d) lipids
- xv. Bacillus is causative agent for
 a) typhoid b) pneumonia
 c) anthrax d) cellulitis
- xvi. Bactericidal drugs
 a) enhance bacterial growth b) stop growth
 c) kill bacteria d) slow down rate of growth
- xvii. Antibodies produced against specific antigen in another host are injected in:
 a) passive immunity b) active immunity
 c) humoral immunity d) none of the above
- xviii. Example of chemolithotrophs is
 a) nitrosomonas b) pseudomonas
 c) E.Coli d) Mycoplasma
- xix. An antibiotic is a drug that selectively kills:
 a) virus b) fungi
 c) bacteria d) all of the above
- xx. _____ is known as the indicator bacteria of water.
 a) clostridium tetani b) bacillus subtilis
 c) E.coli d) staphylococcus aureus



UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) Second Prof: Annual-2019

Roll No.

Subject: Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

PAPER: 4 Part - II (New Course)

Time: 2 Hrs. 30 Min. Marks: 80

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

- Q-2 a) What are the steps in control of microbial contamination in pharmaceutical industry? (12)
b) What are the properties of the effective steam in moist heat sterilization? (08)
- Q-3 a) Discuss the physical and chemical requirements for growth of bacteria. (10)
b) Write a note on Bacterial Growth Cycle with the help of a diagram. (10)
- Q-4 a) Write a detailed note on specific and non-specific immunity. (10)
b) What is an antigen-antibody reaction? Describe its clinical and diagnostic applications. (10)
- Q-5 a) Draw a schematic (steps only) for the production of Benzyl Penicillin in a fermenter. (12)
b) Describe the mercury-produced and xenon-produced UV irradiation method for sterilization. (08)
- Q-6 a) Define vaccination; discuss the types of Vaccines and their applications in controlling the different diseases. (12)
b) Write a detailed note on Microbiology of soil. (08)
- Q-7 What are viruses? Discuss the general Morphology, Isolation, Cultivation and Identification of viruses. (20)



UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) 2nd Prof: Annual-2021

Roll No.

Subject: Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

Time: 2 Hrs. 30 Min. Marks: 80

PAPER: 4 Part – II (New Course)

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

- Q-2 Define antibodies and discuss its structure, types and antigen-antibody reactions. (20)
- Q-3 a) Describe the thermal curves. What are their applications in testing of sterilization of pharmaceutical products? (06)
b) Describe UV irradiation method of sterilization in such a way that the mercury-produced UV and Xenon-produced UV could be differentiated. (14)
- Q-4 What do you mean by Fermentation? Discuss the process of penicillin production. (20)
- Q-5 Define virus. Discuss its structure, general morphology, its growth and multiplication of DNA virus. (20)
- Q-6 a) Discuss Bacterial Growth Curve. (10)
b) Discuss the Structure and function of bacterial cell wall and flagella. (10)
- Q-7 a) Classify Pneumonia. Discuss its types, pathogenesis and treatment. (10)
b) Write a note on Nosocomial Infections. (10)



UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) 2nd Prof: Annual-2021

Subject: Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)

Paper: 4 Part - I (Compulsory) (New Course)

Time: 30 Min. Marks: 20

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

1. This Virus, for the first time, was synthesized in the form of no-living crystals

- a) Pox Virus
- b) Flu Virus
- c) Tobacco mosaic virus
- d) Bacteriophage

2. Which of the following is the genome of virus?

- a) DNA
- b) RNA
- c) DNA and RNA
- d) DNA or RNA

3. Rejection of transplanted tissue is an example of hypersensitivity of

- a) Type-I
- b) Type-II
- c) Type-III
- d) Type-IV

4. Depyrogenation temperature is

- a) 250°C or above
- b) 130°C
- c) 121°C or above
- d) 200°C or above

5. Common Polyhedral capsid shape of virus is

- a) Pentagon
- b) Cube
- c) Icosahedron
- d) Pyramid

6. If a microorganism is capable of causing disease microorganism is called

- a) Virulence
- b) Detrimental
- c) Causative agents
- d) Pathogen

7. The conversion of molecular nitrogen into ammonia is known as

- a) Nitrification
- b) Denitrification
- c) Nitrogen fixation
- d) Ammonification

8. Bacteria with variable shapes is termed as

- a) Cocci
- b) Bacilli
- c) Pleomorphic
- d) Spirochetes

9. The condition for moist-heat sterilization is:

- a) 134 °C for 10 min
- b) 115 °C for 30 min
- c) 121 °C for 15 min
- d) 100 °C for 10 min

10. Mushrooms are classified in which of the following division?

- a) Ascomycota
- b) Basidiomycota
- c) Zygomycota
- d) Deuteromycota

11. Entamoeba histolytica is found in

- a) Stomach
- b) Large intestine
- c) Small intestine
- d) Brain

12. What is the full form of BCG Vaccine?

- a) Bacterial Cold Gene
- b) Bacillus Calmette-Guerin
- c) Bacillus Coded Gene
- d) Bacterial Coded Guerin

13. Which one of the following temperatures would most likely kill a mesophile?

- a) -50°C
- b) 0°C
- c) 9°C
- d) 60°C

14. _____ are the viruses that reproduce inside bacteria:

- a) Bacteriophages
- b) Oncoviruses
- c) Adenovirus
- d) Retroviruses

15. _____ is a set of undesirable reactions produced by normal immune system

- a) Hypersensitivity
- b) Tolerance
- c) Autoimmunity
- d) Cytotoxic reactions

16. In Sterilization process, 1 log reduction means reduction of

- a) 10 unit
- b) 100 %
- c) 10 folds
- d) 10 decimal

17. The first vaccine to prevent people from getting cow pox was proposed by

- a) Edward Jenner
- b) Robert Koch
- c) Paul Ehrlich
- d) Fleming

18. _____ involved in photosynthesis is responsible for distinctive colors of many algae

- a) Chlorophyll
- b) Pigments
- c) Storage material
- d) Starch

19. Reduction of microbial population to a safer level is

- a) Sanitation
- b) Disinfection
- c) Depyrogenation
- d) Pasteurization

20. In which form Plasmodium enters the human body?

- a) Phanerozoites
- b) Cryptozoites
- c) Gametocytes
- d) Sporozoites