Chattogram Veterinary and Animal Sciences University

Department of Microbiology and Veterinary Public Health

MS in Microbiology; January-June Semester, 2023

Subject: Industrial Microbiology, Course code: IMS-601

Total Marks: 40; Time: 2 hours

(Figures in the right margin indicate full marks. Answer any four questions)

1	a)	Define chemostat. What are the critical components you will consider during the design of fermentation media for autotrophic organisms?	5
	b)	Mention the recombinant products derived from different microbial sources and their industrial values.	3
	c)	Write down the difference between scale up and scale down.	2
2	a)	What is fermenter? What are the prerequisites you should maintain for aseptic operation during a successful fermentation process?	5
	b)	Enlist the filtration system that was used to remove the finest particles and dissolved salts. Briefly describe the absolute filtration system.	5
3	a)	Mention the different raw materials and organisms useful for ethanol production. Write down the diverse uses of ethanol.	3
	b)	Classify wine. Write down the production process for champagne.	4
	c)	Define BOD. Briefly explain the activated sludge process for waste water derived from leather industries.	3
4	a)	Enlist the microbial enzymes that are specifically used for therapeutic purposes. Briefly describe the nutritive value and therapeutic importance of fermented food.	5
	b)	Suppose you are appointed as an industrial biosafety officer, and your task is the design and establishment of a BSL-4 laboratory. Outline the infrastructure and machinery essential for the development of this facility.	5
5	a)	What does HEPA stand for? Mention the major health hazards associated with fermentation and recombinant technology.	4
		Write down the following short notes:	3+3
		I. Instrumentation	
		II. Manufacturing of antibiotics	

Chattogram Veterinary and Animal Sciences University
MS in Microbiology Final Examination
January – June Semester 2023
Course title: **Food Microbiology**
Course Code: FMB-601
Full Marks- 40, Time- 2 Hours

Answer any **four** questions; Figures in the right margin indicate full marks

1. a) Write down the name of the organisms responsible for the following conditions (any ten)- **5**
i) Bacterial black rots in egg **ii)** Fishy flavor of milk **iii)** White spots on meat **iv)** Acid and gas formation in meat **v)** Blue mold rot of fruits or vegetables **vi)** Cabbage watery flavor of egg **vii)** Ropiness of cereals **viii)** Fungal pink spots on egg **ix)** Greenish blue to brownish-black spots on stored beef **x)** Spoilage of fish in chilling temperature **xi)** Bacterial surface ropiness of milk **xii)** Whiskers in meat.

b) Describe the color changes of spoiled milk. **2.5**
c) Which factors influencing kind and rate of spoilage in fish? Write down the chemical changes of rotten fish. **2.5**

2 a) Enlist food borne bacterial diseases with their causal agents, incubation period, duration of illness and food involved. **5**
b) "Food-borne intoxications can be caused either by bacteria or fungi." Discuss this statement with reference to one bacterial agent and one fungal agent. **5**

3. a) Define food borne disease outbreak and classify it according to incubation period. **2.5**
b) Differentiate between food borne infection and intoxication **2.5**
c) Briefly discuss the steps of food borne disease outbreak investigation. **5**

4. a) Which factors affect the heat resistance of microorganisms? **2.5**
b) Write down the causes of spoilage of heated canned food. Briefly describe the defects of canned food. **5**
c) Enlist five chemical preservatives used in food with their maximum tolerance, organism affected and uses. **2.5**

5. Write short note on any four - **2.5×4=10**
i) Microbial Enzymes
ii) Inhibitory substance (antimicrobial constituents) of food
iii) Group of bacteria important in Food Bacteriology.
iv) HACCP
v) Single cell protein (SCP)

Chattogram Veterinary and Animal Sciences University
MS in Microbiology Final Examination
January - June Semester, 2023
Course Title: Mycology and Microbiology of Atypical Bacteria
Course Code: MMA 601
Total Marks: 40 Time: 2 hours

Figures in the right margin indicate full marks. Answer any four questions.

1. Enumerate the major rickettsial pathogens and associated diseases in livestock and companion animals. Write down the phenotypic properties of the etiological agent of Q fever. What are the main virulence factors identified in pathogenic *Mycoplasma* species? 3+4+3

2. State the key features of *Aspergillus fumigatus* and *Candida albicans*. Outline the procedures employed for the isolation and identification of *Malassezia pachydermatis* from clinical specimens. List the subcutaneous mycoses along with the causative fungi and main hosts. 3+4+3

3. Explain the mechanism of action of azole and polyene antifungal drugs. Name the pathogenic *Chlamydia* species and their host ranges. Describe the Chlamydial biphasic developmental cycle in host cells. 4+2+4

4. Classify dermatophytes based on ecological niche. Summarize the methods employed for the direct microscopic examination of fungi. How will you differentiate *Microsporum* and *Trichophyton* species based on microscopic appearance? 2+4+4

5. Make a list of the algae and cyanobacteria implicated infrequently in opportunistic infections or intoxications of domestic animals. Give an overview of the immunological and molecular techniques currently used for the identification of different dimorphic fungi. Write down the biological effects of aflatoxins. 3+3+4

Chattogram Veterinary and Animal Sciences University

MS in Microbiology Final Examination

January – June Semester, 2023

Course title: Advanced General Bacteriology

Course Code: AGB-601

Full marks: 40; Time: 2 hours

Answer any 4 (FOUR) Questions.

1. What are the features based on which prokaryotic cells are differentiated from eukaryotic? Describe the chemical constituents seen on the cell wall of Gram negative bacteria. How does a bacterial endospore germinate into a vegetative cell? 10

2. How many ATPs and reduced hydrogen carriers can be produced from a glucose molecule during different pathways of catabolism plus TCA cycle, where applicable? Write down the formation and function of proton gradient in bacteria. 10

3. How does bacterial DNA replicate? With an example, describe the repression-induction mechanism by which a bacterial gene expression can be regulated. 10

4. Except for plasmids are there any mobile genetic materials seen in bacteria? If yes, write down their properties and functions. What should be the ideal characteristics of a plasmid to be used in a recombinant DNA technology? 10

5. How can bacteria develop resistance to different antimicrobials? What are the ways by which antimicrobial resistance in bacterial pathogens can be measured? What is the clinical significance of extended spectrum beta-lactamases (ESBL) produced by bacterial pathogens? 10

Chattogram Veterinary and Animal Sciences University
MS in Microbiology
Subject: Advanced General Virology
Course code AGV 601
January- June Semester 2023
Total mark: 40
Hours: 2 hours
(Figures in the right margin indicate full marks. Answer any four questions)

1	a	What is bacteriophage? Draw and label of an ideal bacteriophage. Mention the use of bacteriophage.	5.0
	b	Explain lytic and lysogenic cycle of bacteriophage with figure. Elucidate one step growth curve of bacteriophage.	5.0
2	a	Explain viral replication process of Retro virus What is the basis of Baltimore classification? List the groups of Baltimore classification with example	10.0
3	a	Define interferon. Mention the biological properties of interferon Explain the mechanism of interferon	3.0 7.0
4	a	Explain viral purification and inactivation process	10.0
5	a	Mention the contribution of scientists in the field of virology	10.0