



UNIVERSITY OF THE PUNJAB

B.A. / B.Sc. Part – I
Annual Examination - 2017

Roll No.

Subject: Microbiology-I

PAPER: A (Fundamentals of Microbiology)

TIME ALLOWED: 2 hrs. & 15 min.

MAX. MARKS: 42

USE SEPARATE ANSWER SHEET PROVIDED

*** INSTRUCTIONS: Part II is Subjective. Attempt three questions from Part II. All questions carry equal marks. Maximum time for Part II is 2 hours and 15 minutes.**

Sr. No.	PART II Attempt any Three Questions	Marks
Q3	a). Give a brief account of Shape and Arrangement of bacterial cells.	5
	b). Compare various types of Light Microscopy.	5
	c). Write a note on Restriction Endonucleases.	4
Q4	a). Is spore formation in bacteria a method of reproduction or a means of multiplication? Explain.	4
	b). Draw a typical bacterial Growth Curve and label the various phases. Discuss those factors which determine the beginning and end of each phase.	6
	c). Differentiate between Selective and Differential culture media with examples.	4
Q5	a). Describe structure and chemical composition of bacterial Cell Wall and its relevance to Gram's staining.	6
	b). Define Genetic Engineering? What are its applications?	4
	c). What are the industrial applications of Pasteurization?	4
Q6	a). Indicate the various toxic derivative of oxygen and explain how aerobic organisms might protect themselves against these derivatives.	5
	b). Give a brief account of Glycolysis.	5
	c). What are major methods of Food Preservation?	4
Q7	Write short notes on the following:	5
	a). Biological Nitrogen Fixation	
	b). Bacterial Capsules	5
	c). Food Intoxication	4



B.A. / B.Sc. Part – I
Annual Examination - 2017

Subject: Microbiology-I

TIME ALLOWED: 45 min.

PAPER: A (Fundamentals of Microbiology)

MAX. MARKS: 28

Instructions: Part I is Objective and should be on a separate sheet with space for Roll No. and Name. Q # 1 and Q # 2 in part I are compulsory and Time for Part I is 45 minutes. Cutting, overwriting and use of ink remover is not allowed.

INSTRUCTIONS: PART I is Objective and should be on a separate sheet with space for Roll No. and Name. Q1 and Q2 in Part I are compulsory and Time for Part I is 45 minutes. Cutting, overwriting and use of ink remover is not allowed.

Sr. No.	PART I Q1 and Q2 are Compulsory	Marks
Q1 a)	State whether the statement is True or False. i). Joseph Lister used the term animalcules to refer the microorganisms he observed. ii). Gram staining is use frequently to identify Mycobacterium that contain high amounts of lipids. iii). Edward Jenner proved the concept of Germ Theory of disease. iv). Members of the genera <i>Pseudomonas</i> and <i>Streptococcus</i> are able to produce endospores v). The function of RNA polymerase is to unzip the DNA double helix. vi). A bacterial medium that contains 3 g of beef extract and 5 g of sodium chloride dissolved in 1L of water is a Complex medium. vii). Photoorganotrophs can survive on minerals and CO ₂ alone.	7
b)	Fill in the blanks by using suitable words. i). Flagella are composed of long, rigid strands of a protein called _____. ii). Teichoic acid is present in the cell walls of _____. iii). _____ staining is particularly applicable for staining rickettsias and protozoa. iv). The loss of water and shrinkage of a bacterial cell in a hyperosmotic environment is known as _____. v). _____ equation is used to calculate the generation time "g" of bacterial population. vi). Anabolic reactions usually involve the _____ of energy, while catabolic reactions involve the _____ of energy. vii). Psychrophiles grow well at _____ °C and have an optimum growth temperature of _____ °C or lower; the maximum is around _____ °C.	7

Q2

Encircle the most appropriate answer.

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i). The biggest obstacle in the acceptance and development of the science of microbiology was:

- (a). Lack of effective vaccines (b). Lack of sterile containers
(c). Theory of spontaneous generation (d). Use of aseptic technique

ii). What surgical practice was established by Lister?

- (a). Antisepsis (b). Chemotherapy
(c). Sterilization (d). Tyndallization

iii). The association of endotoxin in Gram-negative bacteria is a result of the presence of:

- (a). Peptidoglycan (b). Steroids
(c). Lipopolysaccharides (d). Polypeptides

iv). Which one of the following is not a genus within the gram-positive bacteria?

- (a). *Staphylococcus* (b). Methanogens
(c). *Mycoplasma* (d). *Bacillus* and *Clostridium*

v). Spherical bacterial cells in chains would be referred to as a _____ arrangement.

- (a). Tetrad (b). Streptococcus
(c). Staphylococcus (d). Vibrio

vi). A culture of bacteria produces 5 generations in 2 hours. What is the generation time for this bacterium under those conditions?

- (a). 15 minutes (b). 24 minutes
(c). 30 minutes (d). 1 hour

vii). If the carbon source in a medium is beef extract, the medium must be an example of:

- (a). Complex (b). chemically defined
(c). Selective (d). Synthetic

viii). Microorganisms that use organic compounds as energy and carbon sources are:

- (a). Chemoheterotrophs (b). Chemoautotrophs
- (c). Photoautotrophs (d). Photoheterotrophs

ix). The electron transport chain is directly involved with:

- (a). ATP synthesis (b). CO₂ production
- (c). H⁺ pumping (d). Generating O₂ gas

x). A frameshift mutation is:

- (a). Insertion of one base (b). Insertion of more than one base
- (c). Deletion of one or more bases (d) All of the above

xi). The enzyme _____ adds complementary bases to the DNA template strand during replication.

- (a). Ligase (b). Helicase
- (c). DNA polymerase (d). RNA polymerase

xii). For bactericidal activity _____ have the ability to cause thymine dimer formation.

- (a). Ultraviolet light (b). X rays
- (c). Gamma rays (d). Microwaves

xiii). How many chromosomes are found in typical bacterial cell?

- (a). 2 (b). 1
- (c). 4 (d). 23

xiv). Which of the following bacterial groups would you expect to be most likely associated with human infections?

- (a). Thermophiles (b). Mesophiles
- (c). Lactophiles (d). Psychrophiles