

Paper Code B110502T A (SVSU:2025-26/R)

Enrollment No.														
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Program Name: B.Sc. Biochemistry

V Semester / 3rd Year Examination

Subject Code: B110502T

Subject Name: Fundamental of Microbiology

[Time : 03:00 Hours]

[Max. Marks : 75]

Note : 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [01×15=15]**I** Who is known as the "Father of Microbiology"?

- (a) Louis Pasteur (b) Anton van Leeuwenhoek
(c) Robert Koch (d) Alexander Fleming

II The concept of **biogenesis** states that:

- (a) Life arises spontaneously
(b) Life originates from non-living matter
(c) Life arises from pre-existing life
(d) Microbes are eternal

III Robert Koch is best known for:

- (a) Discovery of viruses (b) Germ theory of disease
(c) Discovery of penicillin (d) Spontaneous generation

IV Fleming discovered **penicillin** from which microorganism?

- (a) *Penicilliumchrysogenum* (b) *Aspergillusniger*
(c) *Rhizopusstolonifer* (d) *Candida albicans*

V Gram-positive bacteria differ from Gram-negative bacteria due to:

- (a) Thicker peptidoglycan layer
(b) Outer lipid membrane
(c) Presence of LPS
(d) Absence of cytoplasm

VI The **growth curve** of bacteria includes which phase first?

- (a) Log phase (b) Lag phase
(c) Stationary phase (d) Death phase

VII The **autoclave** is used for sterilization by:

- (a) Dry heat (b) Chemical agent
(c) Moist heat under pressure (d) UV radiation

VIII Alcohol acts as an antimicrobial agent by:

- (a) Denaturing proteins and dissolving lipids
(b) Destroying DNA
(c) Oxidizing cell wall
(d) Inhibiting ribosome function

- IX** The test used to determine antibiotic sensitivity is:
(a) Gram staining (b) Disc diffusion test
(c) PCR (d) Spore test
- X** Penicillin primarily acts by:
(a) Inhibiting DNA synthesis
(b) Inhibiting cell wall synthesis
(c) Inhibiting protein synthesis
(d) Inhibiting folic acid synthesis
- XI** Thermophiles are organisms that thrive in:
(a) Acidic pH (b) High temperature
(c) Saline conditions (d) Cold temperature
- XII** The process of **conjugation** in bacteria involves:
(a) Uptake of naked DNA (b) Virus-mediated DNA transfer
(c) Direct cell-to-cell contact (d) Cell lysis
- XIII** *Saccharomyces cerevisiae* is mainly used in:
(a) Antibiotic production (b) Alcoholic fermentation
(c) Cheese ripening (d) Vitamin synthesis
- XIV** Viruses are classified based on:
(a) Cell wall composition
(b) Host, nucleic acid type, and structure
(c) Gram reaction
(d) Energy metabolism
- XV** The first discovered virus was:
(a) Tobacco mosaic virus (b) Influenza virus
(c) HIV (d) Rabies virus
- 2. Answer in long (any three) [10×3=30]**
- I** Describe the contributions of Louis Pasteur and Robert Koch to the field of microbiology.
- II** Explain the process and phases of the bacterial growth curve.
- III** Discuss the methods of sterilization by physical and chemical agents.
- IV** Describe the basic design and operation of a fermenter used in industrial microbiology.
- 3. Answer in short (any six) [6x5=30]**
- I** Differentiate between spontaneous generation and biogenesis.
- II** Describe the contributions of Louis Pasteur to microbiology.
- III** Explain the principle and use of an autoclave.
- IV** Write short notes on Gram-positive and Gram-negative bacteria.
- V** What is the microbial growth curve?
- VI** Explain transformation in bacteria.
- VII** Define bioremediation and give one example.

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Paper Code: B110501T

C (SVSU:2025-26/R)

Enrollment No.

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Program Name- B.Sc Biochemistry

V Semester / III Year Examination

Subject Code-B110501

Subject Name- Bioenergetics and Metabolism

[Time : 03:00 Hours]

[Max. Marks : 75]

Note: 1. Attempt all the questions as per given instructions.

2. Fill the correct answer of MCQs

1. Multiple Choice Questions (MCQs) [01×15=15]

I Bioenergetics deals with:

- a) Energy transformation in biological systems
b) Metabolism of carbohydrates only
c) Chemical kinetics
d) Enzyme inhibition

II Which component of ETC directly donates electrons to oxygen?

- a) Complex I
b) Complex IV
c) Coenzyme Q
d) Cytochrome b

III Uncouplers of oxidative phosphorylation act by:

- a) Blocking ATP synthase b) Inhibiting NADH oxidation
c) Enhancing ETC efficiency d) Collapsing proton gradient

IV In the TCA cycle, CO₂ is released during conversion of:

- a) Succinate $\rightarrow$ Fumarate
b) Isocitrate $\rightarrow$ α -Ketoglutarate
c) Malate $\rightarrow$ Oxaloacetate
d) Citrate $\rightarrow$ Isocitrate

V The primary product of the Calvin cycle is:

- a) Pyruvate b) Glucose-6-phosphate
c) G3P (Glyceraldehyde-3-phosphate) d) Ribulose-1,5-bisphosphate

VI Photorespiration occurs due to the oxygenase activity of:

- a) RuBisCO
b) PEP carboxylase
c) Pyruvate kinase
d) ATP synthase

VII C4 plants minimize photorespiration by:

- a) Spatial separation of CO₂ fixation and Calvin cycle
b) Increasing RuBisCO oxygenase activity
c) Increasing glycolysis
d) Reducing ATP synthesis

VIII The enzyme catalyzing the first step of β -oxidation is:

- a) Acyl-CoA dehydrogenase
b) Thiolase
c) Enoyl-CoA hydratase
d) Ketoacyl-CoA reductase

