

Master of Science (M.Sc.) Semester—I (CBCS) (Microbiology) Examination
MEMBRANE STRUCTURE AND SIGNAL TRANSDUCTION (MSST)

Paper—4

Paper—IV

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.
(2) Draw well labelled diagrams wherever necessary.

1. Describe structure and organization of endoplasmic reticulum and enlist its functions. 16

OR

Write descriptive notes on :

(a) Differential scanning calorimetry 8

(b) Flow cytometry. 8

2. Explain the concept of co-transport. Add a note on symporters and antiporters. 16

OR

Describe in detail transepithelial transport. 16

3. Write general concept of cell-signaling and give detailed account of G-protein coupled receptors. 16

OR

What are cytokine receptors and discuss its mechanism. 16

4. Explain in detail how sporulation acts as a model of bacterial signal transduction. 16

OR

(a) Discuss mating types of yeast. 8

(b) Diagrammatically illustrate Histidine kinase pathway. 8

5. Write notes on :

(a) Membrane vesicles 4

(b) Active transport 4

(c) MAP kinases 4

(d) Heat shock proteins. 4

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N.B. :—All questions are compulsory and carry equal marks.

1. Discuss the structure of Mitochondria and endoplasmic reticulum. 16

OR

Write notes on :

- (1) Organisation of prokaryotic membrane 8
(2) Tight junctions. 8

2. Explain Active Transport by ATP powered pumps. 16

OR

What is Membrane Transport ? Give detail account on co-transport by symporters and antiporters. 16

3. Discuss RTK and MAP Kinase pathway. 16

OR

Explain the mechanism of cytokine receptors. 16

4. Discuss Histidine Kinase pathway as a model of bacterial signal transduction. 16

OR

Describe in detail Heat Shock Proteins. 16

5. Write brief notes on :
- (a) Membrane vesicles 4
(b) Transepithelial transport 4
(c) Effectors of G-protein coupled receptors 4
(d) Mating types of yeast. 4

NRT/KS/19/2892

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[Maximum Marks : 80

Note :— All questions are compulsory and carry equal marks.

1. Give details on electron microscopic methods for study of membrane structure. 16
OR
Describe Gap junctions and tight junctions in detail. 16
2. Give a detailed account on ATP powered pumps. 16
OR
Describe in detail transepithelial transport. 16
3. Give a detailed account on cytokine receptors and their mechanism. 16
OR
(A) Describe receptor tyrosine kinase. 8
(B) Describe MAP kinases. 8
4. Describe in detail sporulation as a model of bacterial signal transduction. 16
OR
(A) Explain mating types of yeast. 8
(B) Describe Osmoregulatory pathways. 8
5. Write short notes on :
(A) Flow cytometry. 4
(B) Uniport. 4
(C) G-protein coupled regulators. 4
(D) Histidine kinase pathway. 4

AHK/KW/19/1620

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Time : Three Hours]

[Maximum Marks : 80

N.B. :— All questions are compulsory and carry equal marks.

1. Discuss the electron microscopic and phlorescence photobleaching method for membrane structure study. 16

OR

(a) Discuss flow cytometry and its application in membrane study. 8

(b) Synaptic junction and its significance. 8

2. Differentiate between active and passive transport. Give in detail different types of passive-transport. 16

OR

Describe the salient features of ion-gated channels. 16

3. Describe the structure of Tyrosine-Kinase receptor. Illustrate diagrammatically RTK-pathway. 16

OR

Describe in detail the osmoregulatory pathway. 16

4. Describe Histidine Kinase pathway. 16

OR

Discuss Heat shock proteins and their significance to bacterial survival. 16

5. Write notes on :

(a) Membrane structure of endoplasmic reticulum. 4

(b) ATP-pump. 4

(c) Cytokine receptor. 4

(d) spo-genes. 4

**Master of Science (M.Sc.) Semester—I Choice Based Credit System (CBCS)
(Microbiology) Examination**

MEMBRANE STRUCTURE AND SIGNAL TRANSDUCTION (MSST)

Paper - 4

Paper - IV

Time : Three Hours]

[Maximum Marks : 80

N.B. : (1) All questions are compulsory.

(2) All questions carry equal marks.

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|---|----|
| 1. Explain the Structural Organization of mitochondrial membrane. | 16 |
| OR | |
| Write descriptive notes on : | |
| (a) Flow Cytometry | 8 |
| (b) Tight junctions. | 8 |
| 2. Explain antiporters and symporters with examples. | 16 |
| OR | |
| Explain Active transport by ATP powered pumps. | 16 |
| 3. What are second messengers ? Give detail account of cyclic AMP dependent signalling pathway. | 16 |
| OR | |
| What are cytokine receptors and discuss its mechanism of signalling. | 16 |
| 4. Discuss Histidine Kinase pathway as a model of bacterial signal transduction. | 16 |
| OR | |
| (a) Discuss in detail osmo-regulatory pathways. | 8 |
| (b) Discus in detail mating types of yeast. | 8 |
| 5. Write notes on : | |
| (a) Fluorescence photobleaching recovery | 4 |
| (b) Passive transport | 4 |
| (c) Effectors of G-Protein coupled receptors | 4 |
| (d) Heat shock proteins. | 4 |

M.Sc. (Microbiology) Semester—1 (CBCS) New Education Policy (NEP) Examination
 MMT04 : RESEARCH METHODOLOGY

Paper—IV

Time : Three Hours]

[Maximum Marks : 80

Note :—(1) All questions are compulsory and carry equal marks.

(2) Solve the problem, mention the formula wherever necessary.

1. Describe the characteristics and types of research in detail.

OR

Give the importance of literature survey in defining research problem. Describe sources of literature survey. 16

2. What are qualities of good hypothesis ? Describe Null and Alternative hypothesis.

OR

Describe steps, variables and assumption of experimental method in detail. 16

3. Describe measurement of central tendency – Mode, Median and Mean of grouped and ungrouped data with one example each.

OR

Explain presentation of Statistical data by tables, charts and diagrams in detail. 16

4. Discuss in detail types of scientific publication. Write a note on structure of research paper.

OR

What is the concept and need of research report ? Describe the structure of thesis in detail. 16

5. Write notes on :

(a) Defining and formulation of research problem.

(b) Features of good research.

(c) Random sampling method.

(d) IPR.

4×4=16

Preliminary Examination

Winter – 2023

M.Sc. Sem-I

Paper IV: Research Methodology

Time: 3 Hours

Max. Marks: 80

Note:

1) All questions are compulsory and carry marks as indicated.

2) Draw neat and well labelled diagram wherever necessary.

- Q.1. A) Describe characteristics and types of research in detail. 16
- OR
- B) Explain in detail primary and secondary sources of literature. Add a note on importance of literature survey in defining a problem. 16
- Q.2. A) Give qualities of good hypothesis and explain types of hypothesis in detail. 16
- OR
- B) Explain in brief Experimental method of research. 16
- Q.3. A) Write in detail about measures of central tendency. 16
- OR
- B) Write a note on Chi square test. 8
- C) Describe sampling and non sampling errors. 8
- Q.4. A) Describe the structure of project report. 16
- OR
- C) Intellectual Property Rights 8
- D) Structure of a research paper 8
- Q.5. Write short notes on:
- A) Web as a source of literature 4
- B) Features of a good research 4
- C) Bar diagrams and histogram 4
- D) i-10 index and h- index 4

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