Nov-Dec-2024

- DEC 2024

Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. Hons. (Microbiology) (Sem.–1)

CELL BIOLOGY

Subject Code : BSMB-105-19

M.Code. : 78983

Date of Examination : 04-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write **briefly** :

a) Write the role of chromatin in a cell.

b) Draw the structure of muscle cells.

c) What is cell theory?

d) Define actin.

e) Write the functions of ribosomes and lysosomes.

f) What is the role of flagella in cell locomotion?

g) Write briefly about meiosis 1.

h) What are the functions of peroxisomes?

i) What is fixation?

j) What is the difference between gram-positive and gram-negative bacteria?

SECTION-B

2. What is staining? Explain details about the chemical basis of staining.
3. Discuss the structure and function of mitochondria in detail.
4. Discuss the broad classification of cell types within an organism.
5. Discuss about various stages of the cell cycle.
6. What is cell senescence and cell death?

SECTION-C

7. What are microtome and embedding? Explain about the microtome with its application in detail.
8. What is freeze-drying? Write down the steps involved in freeze drying.
9. What is cytophotometric? Write details on cytophotometric methods.

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Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Microbiology) (Sem.–1)

ENGLISH

Subject Code : BTHU103-18

M.Code : 80141

Date of Examination:18-12-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Explain briefly:**

   a) Decoding

   b) One-way model of Communication

   c) Informal communication

   d) Paralanguage

   e) Spoken1 or Oral Communication

   f) Psychological barriers

   g) Importance of communication

   h) Note making

   i) Advantages of written communication

   j) Types of formal communication.

SECTION-B

2. Write a short paragraph on Gratitude.

3. Write a letter to the bank manager asking him to stop payment of a cheque.

4. Write Characteristics of a good paraphrase.

5. Significance of symbols in note making.

6. Discuss some of the important points that must be kept in mind while writing a report.

SECTION-C

7. a) In FOUR sentences, summarise and paraphrase the following passage in an answer to the following question :

   Why is "*learning how to argue*" important?

   Knowing how to argue is a useful skill. We use it on ourselves in order to arrive at decisions; we use it with others as we discuss business strategies or policy changes on committees. As members of an environmental action group, we use it in drafting a letter to the editor of our hometown paper. Moreover, we use it when we discuss tax cuts, and university investment policies. Our ability to express opinions persuasively will allow us to make differences in public life. If we lack the necessary skills, we are condemned to sit on the sidelines. Instead of doing the moving, we will be among the moved.

   b) What are Reports? Discuss in detail various types of reports?

8. Your neighbouring state has suffered a serious earthquake. There is death and destruction all around. Write a letter to a volunteer organization offering your services for visit and help. In your latter describe the service that you can render along with the dates when you will be free to join the group.

9. How to improve your reading comprehension skills? What are the three main types of reading strategies?

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Total No. of Pages : 02

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B.Sc. (Microbiology) (Sem.–1)

CHEMISTRY-I

Subject Code : BSMB-103-19

M.Code : 78981

Date of Examination : 23-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Heisenberg uncertainty principle.

   b) Significance of wave function.

   c) Mesomeric Effect.

   d) Diastereomers with examples.

   e) Stability of free radicals.

   f) Sawhorse projection formula.

   g) Meso compounds using suitable examples.

   h) Configuration and Conformation

   i) Define racemic modification.

   j) Plane of symmetry.

SECTION-B

2. What is hybridization? Explain the hybridization of carbon using suitable examples.

3. Comment on R/S nomenclature system for chiral molecules. Give suitable examples.

4. **Write a note on :**

   a) Aufbau principle and its limitation.

   b) Electronic configuration of atoms.

5. Discuss on different projection formulas used to represent a chiral molecule.

6. **Write a note on :**

   a) E/Z nomenclature.

   b) D/L system of nomenclature.

SECTION-C

7. Discuss in detail about elements of symmetry with examples.

8. Comment on concept of toxicity of ligands and faces with suitable examples.

9. Write in detail about Quantum numbers and their significance.

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B.Sc. (Microbiology) (Sem.–1)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSMB-101-19

M.Code : 78979

Date of Examination : 20-12-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Contributions of J. Tyndall to microbiology.

   b) Examples for gram-negative bacteria.

   c) Fluorescent microscopy

   d) Germination Process

   e) Nitrogen fixing bacteria in agriculture.

   f) Growth rate

   g) Monoauxic growth

   h) Chemical agents used to kill the microbes.

   i) Types of microbial pathogens.

   j) Aerobic fermentation

SECTION-B

2. Elaborate about dark field microscopy.

3. Difference between sporulation and germination process.

4. What is diauxic and synchronous growth?

5. What is microbial interaction like symbiosis?

6. Write down production of heterologous in microbes.

SECTION-C

7. Write about discovery of antibiotics and also discuss the contribution of J lister.

8. Elaborate on the morphology of algae and fungi, emphasizing structure.

9. What is normal microbial flora and how the pathogens causing disease?

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Total No. of Pages : 02

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B.Sc. Honours (Microbiology) (Sem.–2)

MICROBIAL PHYSIOLOGY AND METABOLISM

Subject Code : BSMB-207-19

M.Code : 79878

Date of Examination : 12-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

a) Explain the role of anaerobic respiration.

b) What is diauxic growth curve?

c) What is the role of the periplasm?

d) Define nitrification.

e) Define extremophiles.

f) What is biological nitration fixation?

g) Explain the role of pH in microbial growth.

h) Define mixed acid fermentation.

i) What is peptidoglycan?

j) What is hydrogen oxidation?

SECTION-B

2. Describe the structures of microbial cell surfaces.
3. Compare the EMP and ED pathways of sugar transportation.
4. Describe continuous culture and its significance.
5. Discuss the role of sulfur bacteria in inorganic metabolism.
6. Discuss the components of respiratory chain in aerobic respiration.

SECTION-C

7. Discuss microbial mobility and the functions of organs like flagella and pili.
8. Explain nitrogen cycle focusing on nitrification and denitrification processes.
9. Discuss the impact of environmental factors on microbial growth.

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Bachelor of Science - Honours (Microbiology) (Sem.–3)

VIROLOGY

Subject Code : BSMB301-19

M.Code : 90367

Date of Examination : 28-11-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a. What are the General Properties of Viruses?

   b. Draw the structure of Lambda Temperate Phase.

   c. Define DNA Replication.

   d. Name the Stages of Infection.

   e. Salient features of Tobacco Mosaic Virus.

   f. What is Viral Vaccination?

   g. Application of Phages in Microbial genetics.

   h. What is Phage Immunity?

   i. What are Host Specific Viruses?

   j. What are Anti-Viral Compounds?

SECTION-B

2. What are Interferons? Write down their mode of action.

3. Explain the Life-Cycle of Dengue Virus.

4. Give detail about Genetic Mapping and DNA Replication of T4 phage.

5. Write down general properties of Virus. Explain with structures.

6. Explain Replication Pattern of Tobacco Mosaic Virus.

SECTION-C

7. **Briefly discuss the following :**

   a. What are Anti-Viral Compounds? Explain their mode of action.

   b. Discuss the general principles of Viral Vaccination.

8. Write down the classification of Viruses. Give detail about Isolation, Purification and Cultivation of Viruses.

9. **Life Cycle and Replication of :**

   a. Hepatitis Virus

   b. Retroviruses.

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Total No. of Pages : 02

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B.Sc- Honours (Microbiology) (Sem.–3)

MICROBES IN ENVIRONMENT

Subject Code : BSMB305-19

M.Code : 90371

Date of Examination : 10-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Function of the ecosystem.

   b) Enlist soil microflora.

   c) Define Microbiomics.

   d) What is the role of temperature in extremophiles?

   e) What is synergism in microbial interaction?

   f) Difference between symbiotic and non-symbiotic.

   g) Define mutualism.

   h) Enlist the types of solid waste.

   i) Role of BOD in waste management.

   j) Enlist the sources of solid waste.

SECTION-B

2. Discuss in detail soil profile and soil microflora.

3. Explain the habits of microbes at different pH, osmotic pressure and low level of nutrients.

4. Give in detail microbe plant interaction.

5. Describe the sources and types of solid waste management.

6. Write down the methods used for tertiary sewage treatment.

SECTION-C

7. Write a detailed note on liquid waste management.

8. Describe the role of the ecosystem as well as microflora of fresh water and marine habitats.

9. Illustrate microbes in ruminates, nematophagus fungi and symbiotic luminescent bacteria.

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B.Sc. (Hons.) Microbiology (Sem.–3)

MICROBIAL GENETICS

Subject Code : BSMB303-19

M.Code : 90369

Date of Examination : 25-11-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. What are the major differences between Eukaryotic and Prokaryotic genomes?

   b. What do you mean by genetics?

   c. What are the different methods of physical mapping of the genome?

   d. Explain the mutator gene.

   e. Define silent mutation.

   f. Define Hfr strain.

   g. What is the post-translational modification of proteins?

   h. Define the plasmid.

   i. What is Mu transposon?

   j. Explain two uses of transposon.

SECTION-B

2. What is a transposon pool and, what is its mechanism?

3. Name different types of transductions and their use and how they differ?

4. Explain conjugation and its mechanism.

5. Explain the significance of the Ames test and the various components used in performing this test.

6. Define the mechanism of plasmid amplification.

SECTION-C

7. Definition and types of mutation in brief.

8. Explain the mechanism of transduction and transformation.

9. **Briefly discuss the following :**

   a) Define plasmid and its types.

   b) Difference between replicative and non-replicative transposition.

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Total No. of Questions : 09

Bachelor of Science/Honours (Microbiology) (Sem.–3)

BIOSTATISTICS

Subject Code : BSMB308/19

M.Code : 90374

Date of Examination : 02-12-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Answer briefly :**

   a. Define Variance.

   b. Define Kurtosis.

   c. If a dice is thrown one time what is the probability to get 3 on the dice?

   d. Plot the graph which shows Negative correlation.

   e. Give any two examples for non-parametric tests.

   f. Calculate the mean for the data 5, 7, 15, 8, 9, 6, 13.

   g. Define Mode.

   h. Write the importance of t-test.

   i. Define poisson distribution.

   j. Write any two uses of chi-square test.

SECTION-B

2. Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and Drug B is indigenous. The Decrease in weight after using 6 months as follows :

Drug A	10	12	13	11	14		
Drug B	8	9	12	14	15	10	9

Is there a significant difference in the efficacy of the two drugs (For v = 10 $t_{0.05}$ is 2.223; For v = 9 $t_{0.05}$ is 2.262; For v = 11 $t_{0.05}$ is 2.201 For v = 12 $t_{0.05}$ is 2.179).

Take the appropriate t value from the above and interpret your result.

3. From the data given below about the treatment of 250 patients suffering from a disease. State whether the new treatment is superior to the conventional treatment.

Treatment	**No. of Patients**		
	Favourable	**Not Favourable**	**Total**
New	140	30	170
Conventional	60	20	80
Total	200	50	250

(Given for Degrees of Freedom = 1 Chi square 5% = 3.84)

4. A coin is tossed for six times. What is the probability of obtaining four or more tails.

5. Write a short note on Shannon weaver index.

6. Write a note on Correlation.

SECTION-C

7. a. The following mistakes per page were observed in a book.

No. of mistakes per page	0	1	2	3	4
No. of times the mistake occurred	211	90	19	5	0

Fit a poisson distribution to fit data. (Given $e^{-0.439} = 0.6447$)

b. Write a note on regression.

8. A tea company appoints four salesmen A, B, C and D and observes their sales in three seasons - summer, winter and monsoon. The data is given below :

Seasons	Salesmen				Season's total
	A	B	C	D	
Summer	36	36	21	35	128
Winter	28	29	31	32	120
Monsoon	26	28	29	29	112
Salesmen's total	90	93	81	96	360

Perform the Two Way ANOVA for the above data.

For (3, 6) d.f $F_{0.05} = 4.76$; For (2, 6) d.f $F_{0.05} = 5.14$.

9. Obtain the rank correlation coefficient between the variables X and Y from the following pairs of observed values

X :	50	55	65	50	55	60	50	65	70	75
Y :	110	110	115	125	140	115	130	120	115	160

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B.Sc- Honours (Microbiology) (Sem.–3)

MICROBIOLOGICAL ANALYSIS IN AIR AND WATER

Subject Code : BSMB307-19

M.Code : 90373

Date of Examination : 15-12-2024

Time : 3 Hrs. Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.**
2. **SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying FIVE marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly:**

a) Define allergens.

b) What is CFU?

c) Significance of air sampling in OT.

d) Examples of water-borne diseases.

e) How treatment of water is done?

f) Define bacteria.

g) Define environment.

h) Define aeromicrobiology.

i) How will you determine positive result in MPN Test?

j) Define HEPA filters.

SECTION-B

2. Write the significance of bioaerosols in food industry.

3. Explain the role of CFU in air sampling?

4. Write down the complete test for water microbes.

5. Write brief note on Bioaerosols.

6. Write brief note on confirmed test for faecal coliforms.

SECTION-C

7. Write a detailed note on the microbial analysis of water.

8. Illustrate various culture media used for bacteria and fungi.

9. Diagrammatically represent membrane filter technique.

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B.Sc-Honours (Microbiology) (Sem.–5)

ENZYME TECHNOLOGY

Subject Code : BSMB509-20

M.Code : 92515

Date of Examination : 25-11-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) What is holoenzyme?

   b) Define allosteric enzymes.

   c) What will be the effect of Km and Vmax in competitive & non-competitive inhibition?

   d) Give any four examples of irreversible inhibition.

   e) Write the equation for substrate reaction.

   f) What is the substrate?

   g) Define isoenzymes.

   h) Give an example of non-competitive inhibition.

   i) What is the unit of enzyme?

   j) How temperature affects enzyme activity?

SECTION-B

2. Write the application of enzyme-based tests in microbiology for biochemical analysis.
3. Discuss about the reversible inhibition.
4. Explain the line Weaver-Burk polt.
5. Classify the enzyme in detail.
6. Write a note on immobilized enzymes and their applications.

SECTION-C

7. Describes in detail about the mechanism of enzyme action.
8. What is enzyme repression induction? Describe the operon model in detail.
9. Explain competitive inhibitions in detail.

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Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.–5)

BIOSAFETY AND INTELLECTUAL PROPERTY RIGHT

Subject Code : BSMB505-20

M.Code : 92511

Date of Examination : 10-12-2024

Time : 3 Hrs.

Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.**
2. **SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying FIVE marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

a) Describe toxicology and allergenicity.

b) What do you understand by D value and Z value?

c) What is the role of NABL?

d) Define ISO.

e) What are the examples of biohazards?

f) Enlist biosafety levels with examples.

g) Define trademark.

h) What is the importance of survival curve?

i) What is the role of GLP?

j) Enlist the objectives of institutional ethics committee.

SECTION-B

2. Write a note on quality management in pharmaceuticals.
3. Discuss in detail about sterilization control and sterility testing.
4. What do you understand by Biosafety committee and its role?
5. Write a short note on patents and trademarks.
6. Write a short note protection of GMOa IP as a factor in R & D.

SECTION-C

7. Write a comprehensive note on Intellectual Property Right.
8. Give a descriptive account on design and layout of sterile product manufacturing unit.
9. Write a descriptive note on good laboratory practices in pharmaceutical industries.

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B.Sc- Honours (Microbiology) (Sem.–5)

IMMUNOLOGY

Subject Code : BSMB501-20

M.Code : 92507

Date of Examination : 28-11-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Adaptive immunity

   b) CALT

   c) Types of antibodies

   d) Epitope

   e) Difference between MHC I and MHC II complex.

   f) Endocytic pathway

   g) T-cell activation

   h) Autoimmunity

   i) Immunodeficiency

   j) Function of lymph node

2. Write a note on antigen antibody reactions.

3. What are antigens? Discuss about antigenicity and immunogenicity.

4. What do you mean by B-cell generation and activation?

5. What is the difference between precipitation and agglutination reactions?

6. What do you mean by overview of transplantation?

SECTION-C

7. Discuss the concept of innate immunity and also explain hematopoiesis and mononuclear phagocytes.

8. Explain the structure and function of MHC I & II molecules.

9. What are hypersensitivity reactions and explain its types?

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B.Sc. Honours (Microbiology) (Sem.–5)

MEDICAL MICROBIOLOGY

Subject Code : BSMB-503-20

M.Code : 92509

Date of Examination : 05-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Toxigenicity

   b) Culturing of clinical sample

   c) Parasitic infection

   d) *Clostridium tetani*

   e) Transmission of infection

   f) Monkey pox

   g) Protozoan infection

   h) Mode of action of anti-microbial agents

   i) Acyclovir

   j) MDR

SECTION-B

2. Explain the septic shock and opportunistic infection.

3. Exemplify one bacterial disease with reference to its transmission, prophylaxis and control.

4. What are respiratory disease and explain about *Mycobacterium tuberculosis*?

5. Write a note on retro viruses including HIV/AIDS.

6. Write a note on inhibitor of the cell membrane function.

SECTION-C

7. What are antifungal agents with its mode of action?

8. Explain about the protozoan infection with its symptoms, pathogenesis, prophylaxis and control.

9. Discuss the nosocomial infection with its transmission and spread.

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