BITS, PILANI – DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
SECOND SEMESTER 2009 – 2010
COURSE No: BIOC 241 MICROBIOLOGY
COMPREHENSIVE EXAMINATION (CLOSED BOOK)

Duration: 3 Hours **Date: 26.05.2010** **Max. Marks: 30**

Note: Answer all the questions
Answer to the point and draw suitable diagrams

1. Explain any two emerging infectious diseases. [2.0]

2. Describe with a suitable diagram on the bacterial cell wall architecture with respect to the principle of Gram staining technique. [2.0]

3. Briefly discuss on Magnetosomes and bacterial Endospores with suitable diagram. Mention the name of the bacterium. [2.0]

4. Differentiate between Gram positive and Gram negative bacteria with respect to the cell architecture and functions with suitable diagrams. Mention industrial applications of each type of bacteria. [2.0]
5. What is most probable number (MPN)? How it is used to measure microbial growth? [3.0]
6. What are HTST and UHT in sterilization of food products? Briefly discuss. [2.0]

7. What is bacterial conjugation? How it is used to map genes on a bacterial chromosome? Explain with an example. Draw suitable diagrams. [4.0]

8. Write a short note on Ribotyping and FISH. [2.0]

9. What are the special characteristics of *Mycobacterium* sp? Explain with a diagram. [2.0]
10. Describe bacterial exotoxins and endotoxins with suitable example. Explain the action of Exotoxins and Endotoxins. [3.0]

11. What are the basic defense mechanisms of the eyes, respiratory system, digestive system and lymphatic system? Explain with suitable diagrams. [2.0]

12. Write a short note on the following bacterial diseases of the upper respiratory system (i. bacteria; ii. toxins; iii. clinical conditions; iv. available treatment methods) [2.0]
    a. Strep throat; b. Scarlet fever
    b. Diphtheria; d. Otitis media

13. Write a short note on the following bacterial diseases (i. bacteria; ii. toxins; iii. clinical conditions; iv. available treatment methods) [2.0]
    a. Cystitis; b. Leptospirosis
    b. Gonorrhea; d. Syphilis

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SECOND SEMESTER 2009 – 2010
COURSE No: BIOC 241 MICROBIOLOGY
TEST-II (OPEN BOOK)

Duration: 50 min. **Date: 09.05.2010** **Max. Marks 20**

Note: Answer all the questions
Answer to the point and draw suitable diagrams

1. Differentiate the methods of bacterial identification involving the biochemical tests and lipid profiles of bacteria? What are the advantages and disadvantages of each method? How different these two methods from the principle of 16S rRNA based bacterial identification? [5.0]

2. The G + C content of the bacterial genome is considered into classification of bacteria. How low G+C and high G+C is important and explain with any two example. [2.0]

3. The group of bacteria in the genus *Streptococcus* are considered as potent pathogens. How the *Streptococcus* sp., is classified based on RBC lysis? Explain with suitable diagram. [2.0]

4. Mostly the Fungal diseases are difficult to treat due to multiple antibiotic resistance and are eukaryotes. The drugs used to eradicate fungal diseases often affect the host metabolism. What are the fungal toxins which affect the host and differentiate any two toxins between the bacterial toxins with respect to the mode of action, biochemical and antigenic properties? [4.0]

5. What the different symptoms of a prion disease and how different it is from bacteria induced neurological diseases? [2.0]

6. List any three diseases with the (a) causative organism, (b) symptoms, (c) clinical conditions, (d) toxins, (e) mode of transmission of the following: [4.0]
    1. Skin
    2. Eyes
    3. Nervous system
    4. Lymphatic system.

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SECOND SEMESTER 2009 – 2010
COURSE No: BIOC 241 MICROBIOLOGY
TEST-I (CLOSED BOOK)

Duration: 50 min. **Date: 28.03.2010** **Max. Marks 20**

Note: Answer all the questions
Answer to the point and draw suitable diagrams

1. Briefly explain the discovery of the antibiotic Penicillin with a suitable diagram and list the problems associated with antibiotics? [2.0+1.0=3.0]

2. Write short note on any four beneficial activities of microorganisms. [2.0]

3. Differentiate with suitable diagram of the arrangements and structure of a prokaryotic flagellum and axial filaments. Mention any two functions of each & microbe. [3.0]

4. How bacterial fermentation is identified in a laboratory? What are the different biochemical tests used to identify the process? [4.0]

5. What is plasmolysis? Mention applications. [use diagrams to differentiate]. [1.0]

6. What are the different mechanisms microbes use to grow in the presence of molecular oxygen? Mention how microbes are classified based on the above phenomena. [2.0]

7. What are capnophiles? Give an example. [3.0]

8. Briefly explain the patterns of microbial death caused by treatments with microbial control agents. Mention different factors which influence the effectiveness of antimicrobial treatments. [2.0]

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COURSE No: BIOC 241 MICROBIOLOGY
QUIZ-II (CLOSED BOOK)

Duration: 15 min. **Date: 06.04.2010** **Max. Marks 5**

Name: **ID No:**

Note: Answer all the questions

1. What are phenolics and bisphenol? Give examples for each. [0.5]

2. Briefly explain the mechanism of action of alcohol as a chemical disinfectant. [0.5]

3. How heavy metals act on microbes? Give two examples. [0.5]

4. What are the different gases used as "chemosterilizers"? Give two examples. [0.5]

5. Briefly explain on bacterial conjugation and differentiate with Hfr cell mediated conjugation. [1.0]

6. Write a short note on Transduction. Briefly explain with examples on two different types of transduction. [1.0]

7. What are siRNAs? Mention its applications. [0.5]

8. Brief on Crown Gall Disease of a rose plant. [0.5]

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COURSE No: BIOC 241 MICROBIOLOGY
QUIZ-I (CLOSED BOOK)

Duration: 15 min. **Date: 23.02.2010** **Max. Marks 5**

Name: **ID No:**

Note: Answer all the questions; each question carries 0.5 marks

1. Define the process Pasteurization.

2. Which of the following is not a known causative agent of diseases
   a. viruses
   b. algae
   c. archaea
   d. protozoa
   e. fungi

3. List any four emerging infectious diseases (EIDs) (viral).

4. Write a short note on Cryptosporidiosis.

5. What are Glycocalyx and write the components.

6. What are H-Antigens and O-Polysaccharides?

7. What are the functions of "Porins", list at least any four (4)?

8. Poly-β-hydroxy butyric acid
   a. Acid
   b. Fat
   c. Lipid
   d. Organic compound
   e. Polymer

9. Name any 4 (four) industrially important fermentation products with the name of the microbe.

Fermentation End Product	Microorganism
a.	
b.	
c.	
c.	

10. What are (A) Magnetosomes (give an example)

    (B) Endospores (give an example)