

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI, DUBAI-CAMPUS
DUBAI INTERNATIONAL ACADEMIC CITY
SECOND SEMESTER 2011 – 2012
BIO C241 MICROBIOLOGY
COMPREHENSIVE EXAMINATION (CLOSED BOOK)

Duration: 3hours

Date: 10.6.2012

Max Marks: 30

*Note: a) Attempt all questions in the order, b) draw suitable diagram if required and
b) answer to the point*

1. Mention the applications of microbiology in environmental, industrial and agricultural biotechnology. [3.0]
2. Differentiate between microbial and eukaryotic cell with suitable diagram. [4.0]
3. Explain in detail on the principles and the procedure involved on simple, and differential staining with suitable diagrams and examples. [2.0]
4. Describe the different types of microbial appendages present on the cell envelope with suitable diagrams and mention its use for the microbes. [3.0]
5. How eukaryotic microorganisms cause disease in humans? Explain any two types of eukaryotic microbes with suitable diagrams. [2.0]
6. Write a short note on DNA and RNA viruses which cause diseases in humans and plants. [3.0]
7. What are the different factors which affect microbial growth? Explain with suitable diagrammatic representations and the principle involved. [3.0]
8. What are the different products of anaerobic fermentation? Give any four examples, the microbes involved and the applications of each product. [2.0]
9. Why foods need to be preserved for long term applications? Explain any four principles involved in food preservation technology. [3.0]
10. Write a short note on the bacterial conjugation and the principle involved with suitable diagrams. [2.0]
11. Why the personal hygiene is important? Explain with suitable examples. [3.0]

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SECOND SEMESTER 2011 – 2012
BIO C241 MICROBIOLOGY TEST-II (OPEN BOOK)

Duration: 50 min

Date: 6.5.2012

Max Marks: 20

*Note: a) Attempt all questions in the order, b) draw suitable diagram if required and
b) answer to the point*

1. A pastry chef accidentally inoculated small bread with six *S. cerevisiae* cells. If *S. cerevisiae* has a generation time of 60 minutes, how many cells would be in the small bread after 7 hours? [3.0]
2. Briefly explain the cause of cell death in the growth curve resulting from damage to each of the following; [4.0]
 - a. Cell wall
 - b. Plasma membrane
 - c. Proteins
 - d. Nucleic acids
3. The chemical composition of the defined media for *E. coli* and *Leuconostoc citrivorum* is:
a) similar (or) b) different. Justify. [4.0]
4. The protein profiles of *E. coli* grown in nutrient medium and nutrient medium supplemented with sterile milk visualized with Commassie Brilliant Blue R-250 and silver stain shown to be different. Why? [4.0]
5. What are the different factors which affect the microbial growth? Briefly explain the influence of environmental factors in a) normal conditions and in b) in presence of an antibiotic on microbial growth. [5.0]

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SECOND SEMESTER 2011 – 2012
BIO C241 MICROBIOLOGY, TEST-I (CLOSED BOOK)

Duration: 50 min.

Date: 18.03.2012

Max. Marks 20

Note: Answer all the questions

Answer to the point and draw suitable diagrams

1. Briefly explain on the composition with suitable diagram: [4.0]
 - a. Bacterial cell envelope
 - b. Structures outside the envelope
2. What are bacterial endospores and mention the biochemical composition of endospore inner cortex? Mention any one bacterium which forms endospores. [2.0]
3. Differentiate the Bacterial and Archaeon cell wall. Mention any four differences based on biochemical composition of cell wall and/cytoplasmic membrane associated with cell wall. [4.0]
4. How the mitochondrial and chloroplast functions of eukaryotic cells are carried out in prokaryotic bacteria though they do not possess chloroplast or mitochondria? Mention any two functions for each. [3.0]
5. What is plasmolysis? Mention applications. [use diagrams to differentiate]. [2.0]
6. Briefly outline with ANY one example for the following: [5.0]
 - a. Fungi
 - b. Algae
 - c. Protozoa
 - d. Helminths
 - e. Arthropod vectors

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SECOND SEMESTER 2011 – 2012
BIO C241 MICROBIOLOGY QUIZ-II (CLOSED BOOK)**

Duration: 20 min. 16.4.2012 Marks: 5.0 Weightage: 5.0%

Name: _____ ID No: _____

1. What are the normal size of the viruses when compared to bacteria, E. coli and an eukaryotic cell (mention in nanometer (nm) or micrometer (μm) units? [0.5]

2. What is plaque-forming units (PFUs) and mention its applications? [1.0]

3. Define virulent and temperate phages? [1.0]

4. What is use of RNA-dependent RNA polymerase in viruses? [0.5]

5. Brief on the following: [2.0]
 - a. Retroviruses and one example:

 - b. Retroviruses clinical implications:

 - c. Prions and designation of the protein:

 - d. Prions clinical implications:

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SECOND SEMESTER 2011 – 2012
BIO C241 MICROBIOLOGY
QUIZ-I (CLOSED BOOK)**

Duration: 20 min. **27.2.2012** **Marks: 5.0** **Weightage: 5.0%**

Name: _____ **ID No:** _____

1. Why the anaerobes are sensitive to Oxygen and mention how anaerobic environment can be made? [1.0]

2. What are endospores as per the Pasteur's experiment and mention his conclusions? [0.5]

3. What are antibiotics and how it acts on microbial growth? Give examples. [0.5]

4. What is the basic difference between the simple staining and negative staining? [1.0]

5. Briefly write a note on the following and give example media for each: [1.5]
 - a. Selective media

 - b. Differential media

 - c. Enrichment media