Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

III SEMESTER B.TECH (BIOTECHNOLOGY)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: INDUSTRIAL MICROBIOLOGY [BIO 2103]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	A bacterium was isolated with unusually high concentration of Fe_3O_4. What possible purpose might it serve the organism? State an example.	**2m**
1B.	Justify why certain fungi occur in a dimorphic form. What forms do they manifest in? Cite an example, each, for the different forms.	**4m**
1C.	Correlate the structure of delta endotoxin to its functional role as a microbial insecticide.	**4m**
2A.	A new brand of single cell protein in the form of capsules has released in the market, an year ago. People who consumed this had problems of kidney stone formation. Analyze how this would have occurred.	**2m**
2B.	If you are asked to isolate a bacterium with a specific shape from a soil sample, how would you proceed to achieve the task?	**3m**
2C.	Nature has allowed the presence of multiple types of pigments in plant chloroplasts. Reason out why. Illustrate the labelled ultrastructure of chloroplast.	**5m**
3A.	You already know why we perform DNA homology studies and how it works. Can you attain the same objective if you are asked to work with rRNA in place of DNA, in the protocol? Why or why not?	**3m**
3B.	If I provide you with a microbe, terming it "*an alga in a glass house*", what do you think it is? Why can it be described so? State its commercial application.	**3m**

3C.	I manipulate both the physical environment and the chemical composition of the medium, inoculated with an *E.coli* sample, such that they grow in a synchronous mode. Sketch the growth curve upto 2 generations. What steps should I take to ensure that the growth curve trend remains the same, even after 5 generations? How does the growth curve look like, now?	**4m**
4A.	Discuss, in detail, on the structural aspects and life cycle of *Taenia saginata*.	**5m**
4B.	You are in charge of evaluating new diagnostic kits for rapid identification of microorganisms. You are assigned a target organism, its antibodies and a fluorescent dye. Devise a protocol for detecting the target from a human clinical sample.	**5m**
5A.	The objective of a light microscope is made of pure flint glass, which has a refractive index (RI) of 1.6. The size of the cone of light produced is 116˚. What would be the numerical aperture of the lens, if (i) a dry objective is used? (ii) cedar oil immersion objective is used? The oil has an RI of 1.3.	**4m**
5B.	A medical case file describes an acute function in the ghon focus of an individual. What probably is he/she suffering from? Elucidate, in detail, on its transmission and pathogenesis.	**6m**