Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **15BT3020** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INDUSTRIAL MICROBIOLOGY** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| 1. |  | How will you detect and quantify the fermentation products using physico-chemical, spectrophotometric and TLC analyses? | CO1 | 20 |
| (OR) | | | |  |
| 2. | a. | Bring out the steps involved in inoculum development. | CO1 | 8 |
| b. | Why the improvement of microbial strains? Describe the strain improvement using R-DNA technology. | CO1 | 12 |
|  |  |  |  |  |
| 3. | a. | What are the criteria for culture media preparation for industrial fermentation? | CO1 | 4 |
| b. | Distinguish between i) selective media & differential media, and ii) isolation media & fermentation media. | CO1 | 6 |
| c. | Bring out the microbial growth kinetics with reference to batch culture, and highlight the merits of continuous fermentation over batch fermentation. | CO2 | 8+2 |
| (OR) | | | |  |
| 4. |  | Explain the batch, fed-batch and continuous (chemostat) fermentation methods with the instrumentation of the respective reactors, and mention the advantages and disadvantages of each. | CO2 | 20 |
|  |  |  |  |  |
| 5. | a. | Bring out the industrial applications of protease enzymes and citric acid. How will you justify that they are the products of fermentation? | CO3 | 10+2 |
| b. | Name any two groups of microbes employed in the production of methane, and comment on the uses of methane. | CO2 | 8 |
| (OR) | | | |  |
| 6. | a. | Biosurfactants – define, cite examples and list some of their microbial sources. | CO2 | 6 |
| b. | Discuss the working and uses of Air-lift fermenter and bubble column fermenter. | CO2 | 14 |
|  |  |  |  |  |
| 7. | a. | Name the four forms of vitamin B12. In which form and how it is commercially produced? | CO3 | 2+8 |
| b. | Explain the industrial brewing process of beer. | CO3 | 10 |
| (OR) | | | |  |
| 8. | a. | Give the che. structure and ionic nature of Glutamate and lysine.  Explain how Glutamate is commercially produced. | CO3 | 3+7 |
| b. | Describe the stages of industrial production of wine. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | How will you relate fermentation to penicillin production? | CO3 | 8 |
| b. | Give the basic principle of centrifugation. | CO3 | 2 |
| c. | Explain the principle of droplet counter-current chromatography with a schematic representation. | CO3 | 10 |