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



**End Semester Examination – Nov / Dec – 2019**

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|  |  |  |  |
| **Code :** | **17BT2020** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENZYME ENGINEERING** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Clearly explain the enzyme classification system based on Enzyme Commission system (ECS). | CO1 | 20 |
| **(OR)** | | | | |
| 2. |  | Establish the kinetics of basic form of Michaelis-Menten equation and modified form of Michaelis-Menten equation with Briggs-Haldane hypothesis. | CO4 | 20 |
|  |  |  |  |  |
| 3. |  | The kinetics of lactase enzyme aith lactose as a substrate is studied, the velocity of the reaction at varying substrate concentration is given. Find Km and Vm.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Lactose  (moles/lit) | 0.3×10-5 | 0.5×10-5 | 1×10-5 | 3×10-5 | 9×10-5 | | Velocity  (moles/lit.min) | 10.4 | 14.5 | 22.5 | 33.8 | 40.5 | | CO4 | 20 |
| **(OR)** | | | | |
| 4. |  | Derive the equation for Competitive Product inhibition and explain the overall process. | CO6 | 20 |
|  |  |  |  |  |
| 5. |  | Given the following enzyme kinetic data:   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | S (µm) | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 1000 | | V  (µm/min) | 7 | 17 | 29 | 44 | 67 | 67 | 89 | 95 | 98 |   Calculate Km and Vm, what could be the effect on the reaction velocity if the [E] was reduced to 10% of the amount used above. | CO4 | 20 |
| **(OR)** | | | | |
| 6. |  | Derive the equation for Non-competitive Product inhibition and explain the overall process. | CO6 | 20 |
|  |  |  |  |  |
| 7. |  | Analyze the strategies needed to be taken for extraction and purification of intracellular and extracellular enzymes. | CO5 | 20 |
| **(OR)** | | | | |
| 8. |  | Describe different types of enzyme immobilization techniques with suitable diagrams. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Define continuous operation of a enzyme plug flow reactor and develop the formula for its residance time. | CO2 | 20 |