Roll No. | | | | | | | | | | |

Paper Code: BT11

Pre-PHD

(SEM I) ODD SEMESTER EXAMINATION 2016-17

BIOCHEMISTRY, BIOPHYSICS AND MICROBIOLOGY

Time: 3 Hours ***Maximum Marks: 70***

Note:- Attempt All questions. All question carry equal marks.

1. Differentiate any four of the followings: - **[5X4=20]**

- **a)** Unsaturated and saturated fatty acids
- **b)** Reducing and non reducing sugars
- **c)** Essential and Non Essential Amino acid
- **d)** Polar and Non-Polar Amino acid
- **e)** Deoxy-Ribose and Oxy-Ribose sugar
- **f)** Epimer and Anomer

2. Write short notes on any four: - **[5X4=20]**

- **a)** Rancidity of enzyme
- **b)** Activation energy of enzyme
- **c)** Henderson-Hasselbalch equation
- **d)** Ramachandran plots
- **e)** Gram staining
- **f)** pI (Isoelectric point) of amino acid

3. Attempt any two parts of the following: - **[2X10=20]**

- **a)** Discuss the specific growth rate, generation time and death rate of microbes. If the growth rate of *Bacillus subtilis* during the log phase of batch cultivation at three different points were found to be 2.3, 2.6 and 3.0 hr^{-1}, calculate generation time for microbe.
- **b)** Write the differences in organelles of prokaryotic and eukaryotic cell
- **c)** Briefly explain Oxygen Binding Curves with respect to partial pressure of O_2 & CO_2

4. Attempt any two parts of the following: - **[2X10=20]**

- **a)** Discuss the secondary and tertiary structure of protein
- **b)** Derive the Bragg's equation for diffraction of X-ray. Write the application X-ray crystallography
- **c)** What is TCA Cycle? Describe the steps and explain why can't citric acid operate in the absence of Oxygen

5. Attempt any two parts of the following: - **[2X10=20]**

- **a)** Discuss the ATP synthesis in Glycolysis in presence and absence of oxygen
- **b)** Derived the Michaelis–Menten equation used for enzyme kinetics
- **c)** Discuss the pathway of Urea cycle and its significance