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| Description: col LOGO outline  **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**  Register Number:  Date: 12-4-19 | | |
| **B.Sc. MICROBIOLOGY – II SEMESTER** | | |
| **SEMESTER EXAMINATIONP: APRIL 2019** | | |
| **MB 218: Biophysics, Biochemistry and Microbial Diversity** | | |
| Time- 2 ½ hrs Max Marks-70 | | |
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| This paper contains **2**printed pages and **four** parts | | |

**I. Answer any Five of the following: 5 x 3 =15**

1. What are facultative aerobes? Give two examples.
2. What are the bond dissociation energies of O-H hydrogen bond and O-H covalent bond in water?
3. Diagrammatically represent the principle of spectrophotometry.
4. What is mRNA? Write its function.
5. Give names of one disorder each caused by deficiency of Vitamin B1, C and K.
6. What is enzyme inhibition? If the inhibitor has structural similarity to the substrate what type of inhibition would it be?
7. Why are Deuteromycetes are known as imperfect fungi? Give two examples of this class.

II. **Answer any Five of the following: 5 x 5 =25**

1. Explain the different types of radioactive emissions. Give one example of each type.
2. Give 5 points of difference between thermophiles and psychrophiles.
3. Give the basic classification of types of carbohydrates giving examples of each type.
4. Derive the ionic product of water and give its importance.
5. Elucidate the titration curve for amino acid glycine.
6. Explain the associations involved in interactions between attine ants, fungi and actinomycetes.
7. In enzyme kinetics what is the importance of ES complex, explain with help of energy curve. What does the equation *k*-1[ES] + *k*2[ES] mean?

III. **Answer any Two of the following: 2 x 10 =20**

1. A. Give a detailed description of the Watson and Crick model of DNA with appropriate diagram. (7)

B. List out all the requirements for performing agarose gel electrophoresis. (3)

1. Describe in detail the structural hierarchy of proteins.
2. Write notes on- A. Coenzymes and cofactor (3)

B. Draw a detailed chart for classification of viruses. (7)

IV. **Answer the following: 1 x 10 =10**

1. A. You need to prepare acetate buffer of pH 5.27. You are given acetic acid solution of concentration 10 mM and all other requirements are also provided. What moles of sodium acetate will you add? pKa for acetic acid is 4.76. (5)

B. A bioprocess industry is producing some important proteins from an engineered bacterium in large volumes. But these proteins are produced as a mixture and they have to be individually separated for their usage. Explain in brief what would be the best way to achieve this. (5)