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Register Number:

DATE: 17-4-2017

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

B.Sc MICROBIOLOGY- II SEMESTER

SEMESTER EXAMINATION- APRIL 2017.

**MB 215 - Biophysics, Biochemistry and Microbial Diversity.**

**Time: 2 ½ hrs Max Marks: 70**

This question paper has 2 printed pages and 4 parts.

**I. Answer any FIVE of the following questions:**  **3x5 =15**

1.What are the properties of water that make it a good solvent?

2. Give examples and explain predation in bacteria.

3. Define: i) Active site ii) Saponification number iii) Isoelectric pH.

4. How are bacteria classified based on their oxygen requirement? Give examples for

each group.

5. List any deficiency disorder caused by

i) Vitamin A ii) Vitamin D iii) Vitamin C

6. Elaborate the Henderson Hasselbalch equation.

7. Draw the structure of adenosine monophosphate.

**II. Answer any FIVE of the following questions:**   **5x5= 25**

8. Illustrate as a skeletal image the Alexopolus classification of fungi.

9. Explain the nature of association occurring in Lichens. What is the need for negative

interactions in microbes?

10.What is the principle behind the functioning of a centrifuge? List the type of rotors

used.

11. How can you construct an OTU using numerical taxonomy?

12. Write the hydrolysis reaction of triglyceride and halogenation reaction of fatty acid.

13. Explain the types of reversible enzyme inhibition.

14.i) Mot A and MotB are flagellar proteins embedded in the cell membrane. Comment

on the nature of most of the amino acids making up these proteins.

ii) Comment on the importance of protein primary structure in heredity.

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**III. Answer any TWO of the following questions: 10x2 =20**

15. a. A student in a pathology lab has isolated gram negative bacilli from a patient

         suffering from diarrhea, using biochemical and serological methods how can he          identify the pathogen? 8

      b. What is a rooted tree and an un-rooted tree. 2

16. a. Describe the chemical and functional differences in DNA and RNA. 5

b. Write a flowchart on the steps involved in visualizing DNA in the lab. 5

17.a. What is radioactive half life? Derive the equation to calculate the same. 5

b. Draw the construction and explain the working of a spectrophotometer. 5

**IV. Answer the following: 10x1 = 10**

18. a. Hanna opts for a Microbiology honours course but she is surprised that she has to study

bio-chemistry, Why in your opinion is the study of biochemistry essential to understand

microbes? Can you give examples of biophysical techniques you use in lab that will help

in separation and analysis of proteins. 5

b. Contrast the functions and cellular locations of peptidoglycan, phospholipid and

lipopolysaccharide. 5