

DATE: **9** **-04-2018 (1 PM)**

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| **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27** | | | | | | |
| **M.Sc. MICROBIOLOGY – II SEMESTER** | | | | | | |
| **SEMESTER EXAMINATION: APRIL 2018** | | | | | | |
| **MB 8116: Microbial Physiology** | | | | | | |
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| **Time- 2 1/2 hrs** | |  | **Max Marks-70** | | |  |
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| **This paper contains 2 printed pages and 4 parts**  (For supplementary candidates)  Do not write the register number on the question paper  Please attach the question paper along with the answer script.  **I. Answer any Five of the following 5x3=15**  1. Classify enzymes into different classes and mention the reaction they catalyse.  2. What are the end products of heterolactic fermentation and mixed acid fermentation?  3. What are the function of the four complexes of the mitochondrial system in electron transport  chain?  4. Write the non-ionic and the zwitteronic form of cysteine.  5. Sketch the Ramachandran plot and indicate the location of α-helix and β-sheet.  6. “Hard water” contains a relatively high concentration of Ca2+. Explain why soap is ineffective for  washing in hard water.  7. Mention the physiological changes a microbial cell undergoes during starvation stress?  **II. Answer any Five of the following 5x5=25**  8. What are the different ways to represent the three dimensional sugar structures in paper?  9. What are high energy molecules? Draw the structure of two high energy molecules.  10. Explain the steps of gluconeogenesis that by pass those of glycolysis?  11. Why are uncompetitive and mixed inhibitors generally considered to be more effective *in vivo*  than competitive inhibitors?  12. Explain the stages of amino acid catabolism?  13. How do you classify lipids based on their chemical composition?  14. What are the common features of the *de novo* pathways for the synthesis of purines and  pyrimidines?  **III. Answer any Two of the following 2x10=20**  15 a. Are there other possible conformations of the DNA double helix? Explain. **6**  b. A molecule of amylopectin consists of 1000 glucose residues and is branched every 25  residues. How many reducing ends does it have? Explain **4**  16 a. How does photosynthesis in C4 plants differ from the processin C3 plants? **5**  b. Derive and plot the Lineweaver-Burk equation from the Michaelis-Menten equation. **5**  17. Summarize the steps of peptidoglycan synthesis.  **IV. Answer the following 1x10=10**  18 a. Diffusion across cellular membrane is a common phenomenon for many molecules. Which of  the following molecules can move across the lipid bilayer without the aid of transport proteins:  O2, ethanol, glucose and ions. Reason it out. **5**  b. Production of ATP is the most important prerequisite of aerobic oxidation of glucose via  glycolysis, TCA cycle and oxidative phosphorylation. How many ATPs are produce at the end  of oxidation of glucose? Why ATP is said to be the energy currency of the cell? **5**  . | | | | | | |