[53, A-82]

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SARDAR PATEL UNIVERSITY

M.Sc. (II Semester) Examination

Tuesday, April 28, 2015

02:30 PM to 05:30 PM

Microbiology-PS02EMIC03-Microbial Physiology

SC

Total Marks: 70

Q.1 **Mark/select the right answer for the following.** **[08]**

1. Streptomycin belongs to which of the following group of antibiotics?
   a. β lactam **c.** Non β lactam
   b. Aminoglycosides **d.** Quinolone

2. Free floating bacteria living in aqueous phase and not associating with biofilm are
   a. Planktonic **c.** Sessile
   b. Cyanobacteria **d.** Zoo planktonic

3. The first bacteriocin classification scheme was discovered by
   a. Claude Zobelle **c.** Klaenhammer
   b. Alexander Fleming **d.** Singer and Nicolsan

4. The ability of *vibrio fischeri* to produce bioluminescence chemicals only when a certain population density has been reached is an example of
   a. Quorum sensing **c.** Law of thermodynamics
   b. Shelford's law of tolerance **d.** All of the above

5. A small protein that negatively regulates Cpx AR regulon by binding to periplasmic domain of Cpx A is
   a. cpxY **c.** cpxP
   b. cpxR **d.** cpxS

6. Mex AB – Opr M efflux pump in *pseudomonas aeruginosa* is positively regulated by
   a. rpsL **c.** mecA
   b. TetM **d.** mexR

7. The _____methylesterase is part of feedback loop that resets the receptors for excitation when organism encounters a higher concentration of attractant or moves toward a lower concentration
   a. CheB **c.** CheR
   b. CheP **d.** CheW

8. Which organism is responsible for the production of cytolethal distending toxins (CDT)?
   a. *Bacillus anthracis* **c.** *Clostridium Spp.*
   b. *Haemophillus ducreyi* **d.** *Staphylococcus spp*

Q.2 **Answer the following questions. (any seven)** **[14]**

1. Explain porins and their role.
2. Write in brief about extremophiles with examples.
3. Explain ultrastructure of prokaryotic flagella.
4. Write down the principle of qualitative tests for monitoring spore germination.
5. Diagrammatically explain the phases involved in biosynthesis of PHA.
6. Write a short note on mode of action of nisin.
7. Give detail composition of cell wall of gram negative bacteria.
8. Give any two examples of antifungal antibiotics and explain them.
9. Explain in brief OXY R regulon

Q.3 **a.** Discuss how smooth swimming and tumbling regulates bacterial chemotaxis in presence of an attractant or repellent. **[06]**

b. Write down bioluminescence reaction and explain its regulation in *Vibrio spp.* **[06]**

OR

b. Write note on mechanism of action of A-B toxins giving suitable examples. **[06]**

Q.4 **a.** Discuss physiological and genetic aspects of sporulation in *Bacillus subtilis.* **[06]**

b. Explain the role of genes involved in morphogenesis and cell division in *E.coli.* **[06]**

OR

b. Explain the role of two - component system in osmotic control of gene expression. **[06]**

Q.5 **a.** Explain various mechanism of bacterial resistance to antibiotics **[06]**

b. Explain mechanism of action of antibiotics inhibiting cell – wall synthesis with suitable diagram. **[06]**

OR

b. Write note on : (a) Application of iron chelating compound. **[03]**

(b) Enlist and explain stages of biofilm formation. **[03]**

Q.6 **a.** Discuss the process and importance of quorum sensing in bacteria. **[06]**

b. Write a detail account on application of microbial fuel cell. **[06]**

OR

b. Explain virulence factor secretion systems in gram negative bacteria. **[06]**

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