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No. Of Printed Pages: 2

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SARDAR PATEL UNIVERSITY
M. Sc. (IVSemester) Examination
Saturday, 2nd April, 2016
2.30 p.m. to 5.30 p.m.
Biochemistry - PS04EBIC01 – Microbial Physiology

Q.1 Select the right answer for the following questions: (08 marks)

1. Structural polymer of the fungal cell wall is

(a) Chitin (b) Peptidoglycan
(c) Cellulose (d) Glycoprotein

2. Movement toward chemical attractants and away from repellents is called

(a) gliding motility (b) tumbling (c) chemotaxis (d) none of the above

3. How bacteria respond to high osmolality?

(a) Increase in K^+ ion influx (b) Drop in turgor pressure
(c) Slow growth rate (d) all of the above

4. ß-lactamase degrades

(a) lactose (b) galactose (c) penicillin (d) none of the above

5. Clavulanic acid is a

(a) β-lactamase inhibitor (b) β-lactamase activator
(c) β-lactamase solubilizer (d) none of the above

6. Complex communities of microorganisms attached to surfaces are known as:

(a) Biofilms (b) Flagella
(c) Both of the above (d) None of the above

7. Techoic acids are found in

(a) *Bacillus subtilis* (b) *Lactobacillus plantarum*
(c) *Staphylococcus aureus* (d) All of the above

8. Which of the following enzyme is protecting the aerobic organisms from the toxicity of superoxide and hydrogen peroxide?

(a) Superoxide dismutase (b) Catalase
(c) NADH oxidase (d) Both (a) and (b)

Q.2 Answer **any seven** of the following questions in brief. **(14)**

1. What are mycotoxins? Give examples.
2. Define Bioluminescence and give examples of organisms giving bioluminescence.
3. Explain types and role of cyclins in yeast cell cycle regulation.
4. How the bacterial spores get resistance to ultra violet irradiation?
5. What are PGPR bacteria?
6. What is the function of siderophores in bacteria?
7. Which bacteria produces vacuolating cytotoxin A (Vac A) that causes ulcers in stomach?
8. What are the applications of microbial fuel cell?
9. Write general mechanism of microbial endotoxins.

Q.3 A: Explain the molecular mechanisms of chemotaxis. **(06)**

Q.3 B: What is the average size of bacteria? Explain the cell wall structures of bacteria. **(06)**

OR

Q.3 B: Narrate the pathway for peptidoglycan biosynthesis. **(06)**

Q.4 A: Explain biochemical reactions and significance of bacterial bioluminescence. **(06)**

Q.4 B: Explain the regulation of the oxidative stress response in bacterial cell. **(06)**

OR

Q.4 B: Explain the physiological and genetic aspects of bacterial sporulation. **(06)**

Q.5 A: How biofilms grow? Write the properties of biofilms. **(06)**

Q.5 B: Explain the possible routes of exposure and mechanism of action of botulinum toxin. **(06)**

OR

Q.5 B: Write the applications of siderophore in detail. **(06)**

Q.6 A: Enlist features of a microbial reserve compound. Discuss regulation and biosynthesis of PHA in bacteria. **(06)**

Q.6 B: List any six microbial toxins and give their toxic effects. **(06)**

OR

Q.6 B: What is Quorum sensing? Give examples and explain. **(06)**