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SARDAR PATEL UNIVERSITY
M. Sc. -Integrated Biotechnology – Eight Semester Examination
Tuesday, 29TH March 2016
Time: 02:30 pm to 05:30 pm
PS08CIGIB1: Applied Environmental Biotechnology

Total Marks – 70

Q.1 Mark the right answer of following questions. [08]

1. The C:N ration of organic materials tends to _____ during composting process.
   a. Increase **b.** Remain constant **c.** Decrease **d.** Fluctuate with stages
2. In oxidation pond/facultative pond which function is carried out by algae.
   a. Increase pH **b.** Fixation of N_2 **c.** Phosphrous deposition **d.** None of these **e.** All of these
3. In _____ bioassay, Acetylcholine esterase is categorized as reliable marker to detect pesticide pollution.
   a. Bacterial **b.** Algal **c.** Bioluminescent **d.** Molecular **e.** None of these
4. From the following which compounds are used in vegetable tanning?
   I) Pyrogallol II) Scleroprotein III) Chromium IV) Pyrogallic acid V) Polyphenolic compound
   a. I & II are correct **c.** I & IV are correct
   b. I, II & III are correct **d.** I, IV & V are correct
5. Determine bsCOD of ASP, when the flow rate is $50m^3$, MLSS concentration is $250g/m^3$, Volume of the reactor is $150m^3$ and F/M ratio is 5.
   a. $150g/m^3$ **b.** $3750g/m^3$ **c.** $416.66g/m^3$ **d.** None of these
6. In _____ settling process particles remain in fixed position respect to each other.
   a. Zone settling **b.** Discrete settling **c.** Flocculent settling **d.** Compression
7. Why anaerobic digestion/biomethanation process has strong buffering capacity?
   a. Due to bicarbonates production **c.** Due to ammonia production
   b. Due to VFA production **d.** All of these
8. _____ Biological marker is used in dairy industry to detect fecal contamination.
   a. Carprosterol **b.** Coprostanol **c.** Coprosterrin **d.** Coprophenol

Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE) [14]

1. Write advantages and disadvantages of trickling filters.
2. What is permissible range for pollutants? Differentiate point and non-point source pollution.
3. What are the impacts of dairy industrial effluent?
4. Write advantages and types of biofertilizers.
5. Write the key features of UASB.
6. What levels are decided by EPA for pollution monitoring?
7. Define biofuel. Write disadvantages of biofuel.
8. Which biological markers are used in dairy industry?
9. What are the disadvantages of anaerobic digestion process?

Q.3 A. What is the composition of organic part of sludge? Write a note on biology of activated sludge process. [06]

B. Outline objectives, performances disadvantages and function of septic tank process. [06]

OR

B. What are the key features of UASB? Write a note on significant design consideration of UASB process. [06]

Q.4 A. Draw a diagram of microbial stages of composting process. Discuss the process and significant factors of vermicomposting. [06]

B. Write the pathway of methanogenesis from CO_2 to CH_4 in brief. Outline the microbiology of anaerobic digestion/biomethanation process. [06]

OR

B. Write a brief note on factors affecting anaerobic digestion process. [06]

Q.5 A. Outline the general physicochemical treatment processes of preliminary and primary treatment processes in brief. [06]

B. Write short notes on: 1) Nature and sources of water pollutants [06]
2) Detection methods for pathogenic microbes of sewage

OR

B. Write a detailed note on analytical methods which are used to check strength of water pollution [06]

Q.6 A. Which pollutants are produced during various processes of tannery industry? Write impacts of tannery effluent and draw a well labeled diagram of tannery industrial ETP. [06]

B. What is Kraft pulping? Outline effluent treatment processes of paper and pulp industry. [06]

OR

B. Write the examples of groups of commercial dyes. Summarize various wastewater treatment processes used in dye industry. [06]

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