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QP code: →

79530

Q.P. code.

63984

Subject mode: Choice based

Exam: SYBSc – Sem 3

Subject - Microbiology

Date of exam –

Q.1 A. Define the following: (05)

- i) Bioaerosols-Airborne particles containing mos. Range from 0.02 -100 μ m
- ii) Impaction- The forced deposition of airborne particles on a solid surface.
- iii) Potable water: *Drinking water*, also known as *potable water*, is water that is safe to drink or to use for food preparation.
- iv) Eutrophication: *Eutrophication* (from Greek *eutrophos*, "well-nourished"), or hypertrophication, is when a body of water becomes overly enriched with minerals and nutrients that induce excessive growth of plants and algae. This process may result in oxygen depletion of the water body.
- v) Define bioaugmentation - introduction of exogenic microorganisms into soil to detoxify a particular contaminant

Q.1 B. State whether the following statements are true or false: (05)

- i) Wells sampler is based on collection of aerosols on the basis of centrifugal force - True
- ii) Mesoscale transport involves dispersion of airborne particle up to a distance of 100km- True
- iii) MPN table gives numbers of coliforms present per 1000 ml of water sample.: False
- iv) An ideal indicator organism should not grow in water. : True
- v) Grid sampling involves taking samples at different depths in a given area - False

Q.1 C. Give one example for each of the following: (05)

- i) Air borne animal pathogen -Mycobacterium bovis, Brucella spp, Salmonella spp
- ii) Fungal diseases caused in humans by air borne pathogens- Aspergillosis, Nocardiosis

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- iii) Fresh water environments. : Lakes, Rivers, Springs, Streams, Marshes, Bogs.
- iv) Disinfectants used in tertiary treatment of water. : Chlorine, chlorine dioxide, ozone, bromine, iodine, metal ions, UV radiation, Gamma
- v) Enzymes involved in lignin degradation - laccases and lignin peroxidase

Q.1 D. Select the most appropriate alternative: (05)

- i) AGI-30 is an example of _____ air sampler. (Impingement/Impaction/Centrifugal)----- Impingement
- ii) _____ released from the gramnegative bacteria into the air can cause respiratory distress syndrome. (Proteins/Nucleic acids/LPS) - LPS
- iii) The coliform group includes Escherichia, Enterobacter, Klebsiella and - _____ (Citrobacter, coliphages, Enterococci) Citrobacter
- iv) Humus is made up of _____, humic acid and humins. (fulvic acid, folic acid, citric acid)
- v) Substances that did not exist in nature before their synthesis by humans are known as _____ (antibiotics, xenobiotics, probiotics) xenobiotics

Q.2 A Answer any two of the following: (20)

- i) Write a short note on airborne toxins and its effects. -pg 93 Maier
- ii) Give an account of major steps of modern wastewater treatment with suitable diagrams. Maier 2nd ed. page 506 to 511
- iii) Write a short note on: Physiological methods of studying soil microorganisms Maier 198-209 (in short)/ Subbarao

Q.3 A. Answer any three of the following: (18)

- i) Describe briefly Aeromicrobiological pathway-Pg 96 Maier
- ii) Discuss filtration as an effective method for control of airborne contamination-Pg 114 Maier
- iii) Diagrammatically represent Lemon air sampler-pg 652 Salle
- iv) Biosafety laboratories are designed to control biohazards.-pg 118-119 Maier
- v) Explain launching and transport of bioaerosols in the air-pg 95-97 Maier
- vi) Write a short note on survival and transmission of bioaerosols in an intramural environment -pg 111 Maier

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Q.3 B. Do as directed (any two): (02)

- i) Name a biocidal control method-UV irradiation, ozonation.
- ii) Name one national body significant in controlling air standard- EPA,NAAQS
- iii) Give example of potential biological warfare agent- *Bacillus anthracis*
- iv) Name a radiation resistant microorganism- *Dienococcus radiodurans*

Q.4 A. Answer any three of the following: (18)

- i) Give principle and significance of oxidation ponds and septic tanks in sewage treatment. Maier 2nd ed.page 513 to 516
- ii) Discuss physical chemical and microbial characteristics of lakes and rivers. Maier 2nd ed.page 111 to115
- iii) Give an account of fecal *Streptococci* and *Clostridium perfringens* as indicator organisms. Maier 2nd ed.page 490 to 491
- iv) Give an account of different methods commonly used to identify coliforms in water. Maier 2nd ed.page487 to490
- v) How do Class A biosolids differ from Class B biosolids? Explain methods of their land application. Maier 2nd ed.page 523 to 524
- vi) Give an account of land application of waste water. Maier 2nd ed.page 516 to518

Q.4 B. Do as directed (any two): (02)

- i) Define COD. : Chemical Oxygen Demand or COD is a measurement of the oxygen required to oxidize soluble and particulate organic matter in water.
- ii) Define and give example of fecal indicator. : A group of organisms that indicate the presence of fecal contamination, such as the fecal coliform or *Escherichia coli*.
- iii) Give full form of TOC.: Total Organic Carbon
- iv) Define Sewage: *Sewage* is a type of wastewater that is produced by a community of people.

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Q.5

A. Answer any three of the following:

(18)

- i) Give an account of soil microorganisms and their activities Kolzwan – pg.12-14
- ii) Discuss: Soil composition and soil profile Kolzwan pg1-3
- iii) Explain the nitrogen cycle with the help of a suitable diagram Maier 299-307 (in short)
- iv) Write short notes on the sulphur and phosphorus cycles - Subbarao pg. 292-295
- v) Discuss: Cultural methods of studying soil microorganisms - Maier 173-180 & Subbarao 63-67
- vi) Discuss: In situ and ex situ methods of bioremediation Kolzwan – pg. 33-39

Q.5

B. Do as directed (any two):

(02)

- i) What does the texture of a soil depend on?
It depends on the percentage of sand, silt and clay in it
- ii) What is the size of clay particles?
< 0.002 mm
- iii) Give the principle underlying immunofluorescence
Antibodies labelled with fluorescent dyes are used to detect specific antigens
- iv) Explain the term 'edaphon' - the community of organisms living in soil