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Question Paper Code: 94104

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Fourth Semester

Civil Engineering

19UCE404 - Waste water Engineering

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The liquid waste originating from residential and industrial buildings, are collectively called: CO1- U
(a) Domestic sewage (b) Combined (c) Sanitary (d) none of these
2. The flow velocity in a sewer does not depend on: CO1-U
(a) its grade (b) its length (c) its hydraulic mean depth (d) its roughness
3. What are the methods adopted for disposal of screenings? CO1-U
(a) Burning (b) Burial (c) Dumping (d) all the above
4. In drum type screen, which axis does the drum rotate? CO1-U
(a) Horizontal (b) Vertical (c) Irregular (d) Horizo-vertical
5. _____ in trickling filter contains many species like bacteria and round worms CO1-U
a) Treated water b) Wastewater c) Bio-film d) Air influent
6. The waste stabilization ponds can be CO1-U
(a) aerobic (b) anaerobic (a) facultative (d) all the above
7. The most important type of species involved in the degradation of organic matter in Biological Treatment Processes CO1-U
(a) Photoautotrophs (b) Chemo-heterotrophs
(c) Photo-heterotrophs (d) Chemo-autotrophs

8. In a batch system, maximum growth rate is observed in CO4- App
 (a) Log phase (b) Lag phase (c) Decay phase (d) maturation phase
9. The pH range for proper functioning of sludge digestion tank is CO1- U
 (a) 3.5 (b) 4-5 (c) 6.5-8.5 (d) above 10
10. What is the term used for reuse of sewage sludge? CO1- U
 (a) Compost (b) Solids (c) Bio solids (d) Sludge

PART – B (5 x 2= 10 Marks)

11. What is meant by Population Equivalent? CO1- U
12. Draw a layout of septic tank. CO1- U
13. Draw the layout of activated sludge process. CO1- U
14. List out the different stages in anaerobic process. CO1- U
15. Enlist the factors affecting sludge digestion process. CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) A sewer system has to be laid for a developing city. For effective functioning of this system, suggest the different sewer appurtenances with neat sketch. CO3- Ana (16)
 Or
- (b) A sewage treatment plant has to be set up for a city. Discuss about the various treatment options involved in this with neat sketch. CO3- Ana (16)
17. (a) Design the dimensions of a septic tank for a small colony of 500 persons provided with an assured water supply at a rate of 120 lpcd. Also design soak well for effluent discharge, rate of percolation is 1250 l/m³/day. Assume relevant data in design. CO2- App (16)
 Or
- (b) Illustrate with diagram about the principle, construction details and process involved in design of CO2- App (16)
 (i) Screening
 (ii) Grit chamber
18. (a) Explain in detail about construction and operation of oxidation pond with neat sketch. Along with its merits and demerits. CO4-App (16)

Or

- (b) It was decided to set up a rotating biological contractor (RBC) to treat sewage in industry. Give clear details about the design requirements, construction process, merits and demerits of the process. CO4-App (16)
19. (a) With a neat sketch, elaborate Anaerobic digestion process CO4- App (16)
Or
- (b) Outline the concept of constructed wetlands. Classify its types and applicability. CO4- App (16)
20. (a) Domestic sewage has been discharged into river. The quality of water has been degraded. Discuss about the concept of self-purification with the various natural factors. CO2- App (16)
Or
- (b) Many industries produce sludge at different levels of treatment. If managed properly sludge can be reused for varied purposes. Illustrate sludge management concept to reduce sludge wastage. CO2- App (16)

