

Total No. of Questions : 10]

SEAT No. :

P3705

[5561]-101

[Total No. of Pages : 2

B.E. (Civil)

ENVIRONMENTAL ENGINEERING - II

(2012 Course) (Semester - I) (401001)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, and Q.9 or Q.10*
- 2) *Figures to the right indicates full marks.*
- 3) *Draw neat figures wherever necessary.*
- 4) *Assume any missing data if necessary.*
- 5) *Use of scientific calculators is allowed.*

- Q1)** a) Write Streeter - Phelps equation and explain the terminology. [5]
b) Enlist different disposal techniques of grit and explain any one in detail. [5]

OR

- Q2)** a) Design a bar screen for a peak flow of 40 MLD of sewage. [5]
b) Draw flow chart of conventional sewage treatment plant. [5]

- Q3)** a) Write short note on rotating biological contactor. [5]
b) Write difference between slow rate filtration and high rate filtration. [5]

OR

- Q4)** a) Define sludge bulking. Explain temporary and permanent control measures of sludge bulking. [5]
b) Explain operational problem in trickling filter and its control measures. [5]

- Q5)** a) Design an oxidation pond for the following data [8]
i) Sewage flow = 10 m³/d
ii) BOD of raw sewage = 250 mg/l
iii) Minimum temperature 10°C and maximum 30 °C
iv) Desired effluent = 20 mg/l
v) Location = 20° latitude
vi) Yield of photosynthetic O₂ = 250 kg/ha/d
b) Explain purification principle of phytoremediation technology. Write its working process at field and design parameters. [8]

OR

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- Q6)** a) Write principle, advantages & disadvantages of aerated lagoon. [8]
b) Explain purification principle of root zone cleaning system. Write its working process at field and design parameters. [8]

- Q7)** a) Explain dewatering of sludge by gravity thickener with principle, schematic sketch and working mechanism. [8]
b) Explain stages of anaerobic digestion and factors governing anaerobic digestion. [8]

OR

- Q8)** a) Write working principle, flow sheet, advantages and disadvantages of package sewage treatment plant. [8]
b) Write principle, advantages & disadvantages of Up-flow Anaerobic Sludge Blanket (UASB) Reactor. [8]

- Q9)** a) Write difference between neutralization and equalization. [6]
b) Explain different primary and secondary treatment methods. [8]
c) Write effluent characteristics for dairy industry. [4]

OR

Q10) Give the range of important characteristics of waste water from following industry and draw a suitable flow diagram for treatment for each industry. [18]

- a) Sugar industry.
b) Dairy industry.
c) Distillery industry

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