Total No. of Questions – [9] Total No. of Printed Pages: 2

G.R. No.	

P118 – 122 (ESE)

DECEMBER 2018 / END-SEM

F. Y. M. TECH. (WREE-Civil) (SEMESTER - I)

COURSE NAME: Environmental Chemistry and Microbiology

COURSE CODE: CVPA11182

(PATTERN 2018)

Time: [3 Hours] [Max. Marks: 50]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1)a)Determine how much kg of air required for complete burning of 4 kg of sulfur in coal so as to produce 90 kg of sulfur dioxide. [3 marks]

OR

b)What is buffer solution and explain its applications. [3 marks]

Q.2)a)What is current in amp. required to liberate $3x10^{-2}$ Kg of iodine from potassium iodide solution in 1 hour. [3 marks]

OR

b)Determine rate of reaction constant for first order reaction for the following data

Conc. Mg/l	200	150	100	50	35	20
Time in Min.	0	8	16	25	38	40

[3 marks]

Q.3) a)Draw block diagram of flame photo meter. [2 marks]

OR

b)Explain chromatography and its types. [2 marks]

Q.4) a)What is difference between prokaryotes and eukaryotes [6 marks]

b)What is staining and what are types of staining technic used in microbiology. Also explain need of staining. [8 marks]

OR

Q.5) a)Explain morphology of bacteria. [6 marks]

b)Differentiate between photosynthesis of plant and bacteria. [4 marks]

c)Explain chemosynthesis process. [4 marks]

Q. 6)a)Explain types of nutrient requirement for bacteria. [4 marks]

b)Explain growth phase of bacteria and what factor affect on it. [6 marks]

c)Write short note on diversity of microbiology world. [4 marks]

OR

Q.7) a)What are different types of microscopic technique used. [6 marks]

b)Explain mechanism of uptake of nutrient by the cell. [4 marks]

c)Write short note on taxonomy and phylogeny [4 marks]

Q.8)a) Determine the value of bio kinetic constants using the data given in table derived from laboratory experiments carried out on the five sets of CFSTR model of an activated sludge process without recycle. [10 marks]

Unit No.	I/F mg/L	E/F mg/L	HRT in days	Reactor biomass in mg/L
1	450	10	3.2	132
2	450	20	2.9	130
3	450	34	1.8	132
4	450	65	1.3	123
5	450	70	1.0	119

b)Design ASP for the following data.
I/F BOD =200 mg/l, E/F BOD=20 mg/L , X=4000 mg/L, MCRT=10days, Q=20,000 m3/day, Xr=10,000mg/L, Y=0.5, Kd=0.06 /day. [6marks]
Determine Efficiency of system, HRT, Y0bs, Sludge produced, oxygen requirement.

OR

Q.9) a) Explain working of anaerobic suspended process. [8 marks]

b)Design trickling filter for the following data. [8 marks]
Q=10MLD, I/F BOD=250 mg/L, E/F BOD=25 mg/L, efficiency in both stage is 70%,R1=R2=2, depth 2.5 m.(USE NRC Equation)
Determine volume, area of TF in first and second stage and OLR.