

Name :
Reg No :

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
07 THRISSUR CLUSTER**

FIRST SEMESTER M.TECH. DEGREE EXAMINATION DEC 2017

Civil Engineering

Environmental Engineering

07CE6103 ENVIRONMENTAL CHEMISTRY

Time : 3 hours

Max. Marks: 60

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1a	Give the two types of buffer solutions with example and discuss the buffer action of $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$ mixture.	4
Answer b or c		
b	Calculate the p^{H} of a solution prepared by mixing 50.ml of 0.02M CH_3COOH and 50ml of 0.1M NaOH ($K_a = 1.8 \times 10^{-5}$)	5
c	Discuss the buffer capacity of soil.	5
Q.no.	Module 2	Marks
2a	Explain Hardy Schultz rule. Give any two methods used for the coagulation of colloids.	4
Answer b or c		
b	What is zeta potential? How it is measured? Explain the factors affecting it.	5
c	How the atmospheric colloids are classified based on their i) source and ii) size. Give its impact on the weather and climate.	5
Q.no.	Module 3	Marks
3a	What is nuclear energy? Discuss the theory behind nuclear reactor and atomic bomb giving reactions.	4
Answer b or c		
b	How will you store spent fuel and high level radioactive waste.	5
c	^{18}F is found to undergo 90% radioactive decay in 366 min. What is the computed half life from his observation?	5

Q.no.	Module 4	Marks
4a	0.30 g of CaCO_3 was dissolved in HCl and made to one litre. 100 ml of the above solution required 29ml of EDTA solution on titration. 100 ml of the hard water sample required 32 ml of the same EDTA solution on titration. After boiling, cooling and filtering of 100 ml of this water sample required 10 ml of EDTA solution. Calculate total, temporary and permanent hardness.	4

Answer b or c

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| b | Describe the major organic, inorganic and metallic pollutants present in water. | 5 |
| c | Give the principle and complete procedure for determining BOD of a water sample. | 5 |

Q.no.	Module 5	Marks
5a	What are persistent organic pollutants? Give the general characteristics of persistent organic pollutants.	5

Answer b or c

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| b | Discuss the environmental fate of PAHs. | 7 |
| c | How enzyme cause degradation of pesticides. | 7 |

Q.no.	Module 6	Marks
6a	State and explain Beer-lambertz law. How it is useful to determine the concentration of an unknown sample? Explain.	5

Answer b or c

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| b | Write the principle, instrumentation and applications of UV-visible spectroscopy. | 7 |
| c | Describe principle, working and applications of HPLC. | 7 |