Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S,FE) (FT/WP/S4 PT) Examination December 2025 (2019 Scheme)

Course Code: CET304

Course Name: ENVIRONMENTAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Explain the factors governing the design period of a water supply scheme	(3)
2		What points are to be considered in selecting a suitable site for a pumping station for water supply scheme	(3)
3		Find the settling velocity of a particle under the following conditions a) Diameter of the particle - 0.099 mm, b) Specific Gravity - 2.65 c) Temperature of water - 30 degree Celsius d) Kinematic Viscosity - 1.007 centistokes Check whether Stoke's Law is applicable or not	(3)
4		What is flow through period, detention period and displacement efficiency of a sedimentation tank	(3)
5		Briefly explain the working of a pressure filter	(3)
6		Explain Break point Chlorination	(3)
7		What are the advantages of providing a flow equalization tank in a sewage treatment plant?	(3)
8		What are the disadvantages of an Activated Sludge process?	(3)
9		Explain the sludge thickening methods?	(3)
10		What are root zone waste water treatment system?	(3)

PART B

Answer one full question from each module, each carries 14 marks.

Module I

11	a)	Explain the river intake structures and canal intake structures with neat sketches ?	(8)
	b)	What is percapita water demand and Explain the concept of fluctuation in water demand?	(6)

OR

12	a)	The population data of a city is given in the following table. Determine the population in the year 2034 and 2044 by	(10)

a) Arithmetic method b) Geometric increase method

Year	1954	1964	1974	1984	1994	2004	2014	2024
Population	60000	65000	63000	72000	79000	89000	97000	120000

b) Explain various systems of sewerage (4)

Module II

13 a) Explain the different types of sedimentation tank? (7)

b) Derive an expression for the settling velocity of discrete particles in sedimentation process? (7)

OR

14 a) What do you understand by coagulation and flocculation processes? (6)

b) Describe the method of application of coagulant in water treatment process? (8)

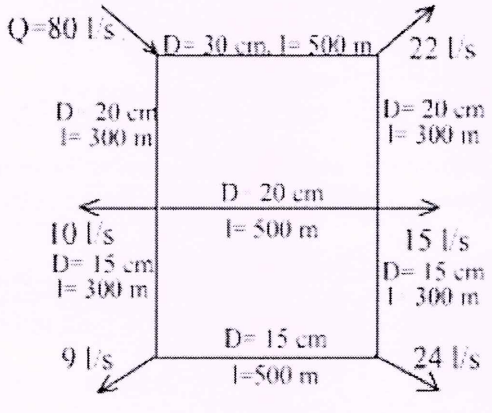
Module III

15 Design a rapid sand filter to treat 10 million litres of raw water per day allowing 0.5% of filtered water for backwashing. Half hour per day is used for backwashing. Assume necessary data. (14)

OR

16 a) Explain different layouts of water distribution network (7)

b) Calculate the head losses and the corrected flows in the various pipes of a distribution network as shown in figure. The diameters and the lengths of the pipes used are given against each pipe. Compute corrected flows after one corrections. (7)



Module IV

17 Design a completely mixed activated sludge system to serve 60000 people that will give a final effluent that is nitrified and has 5-day BOD not exceeding 25 (14)

mg/l. The following design data is available.

Sewage flow = 150 l/person-day = 9000 m3/day BOD5 = 54 g/person-day = 360 mg/l, BODu = 1.47 BOD5. Total kjeldahl nitrogen (TKN) = 8 g/person-day = 53 mg/l, Phosphorus = 2 g/person-day = 13.3 mg/l Winter temperature in aeration tank = 18°C Yield coefficient Y = 0.6 ; Decay constant Kd = 0.07 per day ; Specific substrate utilization rate = 0.038 mg/l)-1 (h)-1 at 18°C. Assume 30% raw BOD5 is removed in primary sedimentation, and BOD5 going to aeration is, therefore, 252 mg/l (0.7 x 360 mg/l).

OR

18 Explain the mechanism of functioning of a trickling filter plant with a neat sketch and also explain its advantages and disadvantages? (14)

Module V

19 a) Explain with a neat sketch the working of an upflow anaerobic sludge blanket reactor (10)

b) What are the advantages and disadvantages of septic tanks (4)

OR

20 a) Explain the sludge digestion processes ? (7)

b) Why sludge dewatering is necessary ? Explain the methods of dewatering the sludge? (7)

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