

Ref No. -Ex/CE/5/T/404/2019(Old)

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) EXAMINATION, 2019
4TH YEAR 1ST Semester (Old)
SUBJECT: Environmental Pollution & Control

Time: Three hours

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions	Part I	Marks
	Answer question no.1 (compulsory) and any three from the rest. Assume relevant data if necessary.	
Q1. a)	Write Short Note (Any Two):	
	i. Haul container system of solid waste collection	5×2
	ii. Octave Band Analysis	
	iii. Different zones of pollution for a river	
b)	Answer all the questions briefly in one or two sentences	2×5
	i. What is overturning in association with lake	
	ii. Write the UNEP classification of countries based on per capita water availability with corresponding values.	
	iii. What do you mean by high heating value of solid waste?	
	iv. What is weighting network?	
	v. What is self-purification factor for a river?	
Q2.	Define and explain the following terms with units of expression: Sound power, sound pressure level and sound intensity, equivalent sound, loudness of sound.	2×5
Q 3. a)	Write two limitations of the Streeter Phelp's equation.	2
b)	A city of 2×10^5 people deposits 37 cubic feet per second(cfs) of sewage having a BOD ₅ of 28 mg/L and DO 1.8 mg/L into a river that has a flow rate of 250 cfs and a flow speed of 1.2 ft/s. Just at the upstream of the release point, the river has a BOD ₅ of 3.6 mg/L and DO 7.6 mg/L. The saturation value of DO is 8.5 mg/L. The deoxygenation coefficient is 0.61/day and the reaeration coefficient is 0.76/day. Assume complete instantaneous mixing of the sewage and river. Find the critical distance for the river and the DO concentration of that point?	8
Q 4.	Identify physical and chemical characteristics of solid waste: specific gravity, field capacity, calorific value and volatile solid. What do you mean by the term landfill? What are the two major environmental consequences of landfilling operation of solid waste? Name two quantification method of solid waste. Name two collection method of solid waste present in India	2×5

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Q 5.	Classify lakes based on productivity. Write two thermal methods of solid waste stabilization. Write one factor affecting self purification capacity of a river. Write the classification and corresponding DBU for surface water according to CPCB.	2×2+1+ 5

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Part-II

Answer **Question No. 1** and any **Two** from the rest. Answers should be brief. Any relevant data may be assumed, if needed.

1. i) Write relevant chemical equations with respect to followings:

(a) formation of the most abundant criteria air pollutant (CAP)

(b) formation of a photolytically dissociable CAP

(c) formation of good ozone

(d) destruction of bad ozone

(e) effect of acid rain on marble

2x5=10

ii) Write the difference between followings:

(a) primary and secondary aerosol

(b) primary and secondary standard

(c) natural and enhanced greenhouse effect

(d) industrial and vehicular smog

(e) reuse and recycle

2x5=10

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2. a) Draw combined absorption spectra of the atmosphere and define Global Warming.
b) Draw global energy balance sketch and define Enhanced Greenhouse Effect. 7+8=15
3. a) Mention two control measures of 'Acid Smog'.
b) 'Control of vehicular pollution is the only mitigation measure of Photochemical Smog'
- explain the sentence. Write the relevant equations.
c) What are the design criteria for an ideal Air Quality Index (AQI)
d) Write the formula of (i) H-1201 (ii) CFC-113 (iii) HCFC-22 (iv) HFC-23 3+5+3+4=15
4. a) 'Lapse rate is favourable in troposphere' –explain. Write the full forms of DALR & SALR.
c) Why is DALR more than SALR?
d) With a sketch define absolutely stable and absolutely unstable conditions.
e) What is wind rose? What is 'NNE' wind direction? Define 'calm' condition 5+2+3+5=15