

B.E. CIVIL ENGG. 4th YEAR 1st SEMESTER EXAMINATION, 2025
(1st / 2nd Semester / Repeat / Supplementary / Annual / Biannual)

SUBJECT: ENVIRONMENTAL ENGINEERING-III
 (Name in full)

Full Marks: 100

Time: ~~Two hours~~/Three hours/~~Four hours~~/ ~~Six hours~~

(50 marks for this part)

Use a separate Answer-Script for each part

No. of Question	Part-I	Marks
	<u>Answer all Questions</u>	
Q.1) a)	Fill in the blanks with appropriate word(s): (CO3) i) One sone is equal to phon of sound. ii) 'Dissipative Muffler' is the synonym of iii) is a subjective characteristics of sound.	3*1=3
b)	Fill in the blanks with appropriate word(s): (CO4) i) refers to hauling of solid wastes to relatively far distances from collection areas or transfer stations. ii) In method of solid waste collection, no collection days need to be specified. iii) The material passing through 4 mm sieve is called compost.	3*1=3
Q.2) a)	State whether the under-mentioned statements are True or False with necessary justifications: (CO3) i) Frequency describes the quality of noise. ii) The instrument used for measurement of sound is called sound pressure level meter.	2*2=4
b)	State whether the under-mentioned statements are True or False with necessary justifications: (CO4) i) Liner arrangement is required in the containers for storing putrescible portion of municipal solid waste. ii) Stationary Container System is recommended for collection of solid waste from the places where the generation rate is enormously high.	2*2=4
Q.3) a)	What do you mean by acoustic impedance? Establish the relationship between acoustic impedance and velocity of sound. (CO3)	(2+5)

[Turn over

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No. of Question	Part-I	Marks																		
b)	Discuss on the Ambient Noise Standard as recommended by CPCB. (CO3)	3																		
c)	The noise spectrum of an electrical saw machine was analyzed at a distance of 4.8 ft from the machine. The results obtained are furnished below: (CO3)																			
	<table><tr><td>Centre Band Frequency (Hz)</td><td>63</td><td>125</td><td>250</td><td>500</td><td>1000</td><td>2000</td><td>4000</td><td>8000</td></tr><tr><td>Sound Pressure Level dB(A)</td><td>74</td><td>62</td><td>79</td><td>72</td><td>74</td><td>77</td><td>76</td><td>75</td></tr></table>	Centre Band Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Sound Pressure Level dB(A)	74	62	79	72	74	77	76	75	
Centre Band Frequency (Hz)	63	125	250	500	1000	2000	4000	8000												
Sound Pressure Level dB(A)	74	62	79	72	74	77	76	75												
	i) What are the total sound pressure level (L_{PT}) and total sound level (L_{PAT}) generated by the machine?	(2+2)																		
	ii) What will be the root mean square pressure (p_{rms}) generated at the given distance?	2																		
	iii) What are the corresponding total sound power and intensity levels ?	2																		
Q.4) a)	Describe different activities involved in the “ Stationary Container System ” of solid waste collection with the help of a neat schematic diagram. (CO4)	6																		
b)	State the reasons behind turning of contents in aerobic composting process. Discuss on the criteria likely to be satisfied for the ‘ Windrow Method of Composting ’. (CO4)	(2+5)																		
c)	A municipal solid waste sample was subjected to ultimate analysis yielding a chemical formula of C₄₄₉H₂₀₄₉O₉₁₂N₁₅S . Calculate the higher and lower heat of combustion of the solid waste sample. Given i) moisture content of the solid waste sample=21%, flammable fraction=57%. (CO4)	5																		

BE Civil Engineering 4th Year 1st Semester Examination 2025

Environmental Engineering III

Time: Three Hours

Full Marks: 100

Use separate answer script for each part

(50 marks for Part I and 50 marks for Part II)

Part-II

Attempt all questions. Provide brief answers.

1 (CO1). Answer very briefly:

- (a) 'TEL was used as an anti-knocking agent'-correlate this sentence with waste minimisation.
 - (b) Mention three bases of classification of air pollutants.
 - (c) 'SO₂ is a primary air pollutant but NO₂ is a secondary air pollutant' -explain why?
 - (d) Why should indoor air quality standards be more stringent than ambient air quality standards?
 - (e) Explain the correlation between Air Quality Index (AQI) and public awareness of the need for air quality management.
- 10**

2(CO2). Answer very briefly:

- (a) Compare the temperature increase caused by the natural greenhouse effect with that caused by enhanced greenhouse effect.
 - (b) Why is ozone-depleting potential of CFCs much higher than that of HCFCs and what is its significance?
 - (c) Why is pH of unpolluted rain water lower than pH of pure water?
 - (d) Mention three basic differences between industrial smog and photochemical smog.
 - (e) What might be the plume pattern be when both ground-level and elevated inversions are present and why?
- 10**

[Turn over

BE Civil Engineering 4th Year 1st Semester Examination 2025

Environmental Engineering III

Time: Three Hours

Full Marks: 100

Use separate answer script for each part

(50 marks for Part I and 50 marks for Part II)

Part II

Attempt all questions. Provide brief answers.

3(CO1) (i) Answer the followings

- a) Why is C_6H_6 considered a criteria air pollutant?
- b) Why was ammonia included in the list of criteria air pollutants in the 1998 revision of Indian National Ambient Air Quality Standards?
- c) Write the equations of formation and destruction of tropospheric ozone?
- d) What is unique about the current Indian Ambient Air Quality Standards?
- e) Why are only eight criteria air pollutants selected from the twelve to calculate India's AQI? 3 X 5 = 15

4(CO2). (i) Answer the followings.

- a) Write chemical formula of the followings: (i) H-1201 (ii) HFC-134 (iii) HCFC-141
- b) List the steps to minimize the criteria air pollutants (before their generation) responsible for acid rain.
- c) Write a short note on Los Angeles smog.
- d) Draw the most conspicuous plume pattern along with associated lapse rates.
- e) List the steps you personally can take to address global warming 3 X 5 = 15