Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2019

CE3EL01 Environmental Engineering

Programme: B.Tech. Branch/Specialisation: CE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. D.O. in streams is: **1**

(a) Maximum at noon (b) Minimum at noon

(c) Maximum at mid night (d) Same throughout the day

ii. Standard 5-day BOD at 20^{o} C, when compared to ultimate BOD, is about: **1**

(a) 58 % (b) 68 % (c) 98 % (d) None of these

iii. The natural process, under which the flowing river water gets cleaned, is known as: **1**

(a) Oxidation (b) Self Purification

(c) Photosynthesis (d) None of these

iv. The phenomenon by virtue of which a soil is chogged with sewage matter, is called: **1**

(a) Sewage farming (b) Sewage Sickness

(c) Sewage bulking (d) None of these

v. Which is the method for measure the PM_{10} **1**

(a) Gravimetric (b) Ultra violet Florescence

(c) Na-Arsenate (d) All of these

vi. The most significant gaseous air pollutant is: **1**

(a) CO_2 (b) O_2 (c) N_2 (d) SO_2

vii. Following is used for measuring intensity of sound. **1**

(a) Sound Level Meter (b) Frequency Mater

(c) Both A & B (d) None of these

viii. What is the permissible noise level standard in the day time at residential zone? **1**

(a) 80 dB (b) 55 dB (c) 45 dB (d) 40 dB

P.T.O.

	ix.	EIA is mandatory under which one of the following India legislations. (a) Indian forest act (b) Air (preventions & control) of pollution (c) Wild life pollution act (d) Environmental Protection act	**1**
	x.	In which year EIA was started in India (a) 1967-68 (b) 1976-77 (c) 1986-87 (d) 1972-73	**1**
Q.2	i.	What is the method of screening?	**2**
	ii.	Explain the working of rectangular sedimentation tank with neat sketch.	**3**
	iii.	A grit chamber with a proportionate flow weir at its outlet to be designed to handle a sewage flow from a population of 50,000 and a per capita daily consumption of water of 135 litres. Consider maximum flow 2.5 times of average, horizontal velocity of sewage inside grit chamber as 20 cm/sec, detention period as 1minute & depth of water as 1meter. Design the grit chamber	**5**
OR	iv.	Explain the physical, chemical & biological characteristics of sewage.	**5**
Q.3	i.	What do you mean by biological treatment of sewage?	**2**
	ii.	Sketch and describe the working of trickling filter for purification of sewage and compare low & high rate trickling filter.	**8**
OR	iii.	Design the activated sludge unit treatment with the following data for a town of population of 65,000. Assume quantity of return sludge as 20 %. (a) Average sewage flow = 210 liters/C/day (b) B.O.D. of the raw sewage = 210 mg/litre (c) Suspended solids in raw sewage = 300 mg/litre (d) B.O.D. removal in primary treatment = 40% (e) Overall B.O.D. removal desired = 90%	**8**
Q.4	i.	What are primary and secondary air pollutants? Explain these two categories by giving suitable examples.	**3**

	ii.	Explain the working of respirable dust sampler (RDS) to monitor particulate matter and gaseous pollutant in ambient air.	**7**
OR	iii.	Write in detail the working and application of ESP (Electrostatic Precipitator) and also mention the sources and harmful effects of NOx on human health as well as plants.	**7**
Q.5	i.	Explain the effects of Noise Pollution on human health.	**4**
	ii.	If a Sound source has a Pressure of 2000 micro pascal at 10 m distance with sound intensity 9.9×10^{-9} W/m^2 and the reference pressure (20 micro pascal), Compute: (a) The Sound Pressure Level in dB, (b) The Sound Power in W.	**6**
OR	iii.	Write a brief explanatory note on "noise control" and mention typical values of acceptable sound level in different zone as per CPCB guideline.	**6**
Q.6		Attempt any two:	
	i.	Explain in detail the different stages of EIA.	**5**
	ii.	Explain the concept of assessment of impact of air, water, noise and socio-economic environment.	**5**
	iii.	Describe the complete procedure of the written documentation of environmental impact assessment.	**5**

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Marking Scheme
CE3EL01 Environmental Engineering

Q.1	i.	D.O. in streams is: (a) Maximum at noon	**1**
	ii.	Standard 5-day BOD at 20^{o} C, when compared to ultimate BOD, is about: (b) 68 %	**1**
	iii.	The natural process, under which the flowing river water gets cleaned, is known as: (b) Self Purification	**1**
	iv.	The phenomenon by virtue of which a soil is chogged with sewage matter, is called: (b) Sewage Sickness	**1**
	v.	Which is the method for measure the PM_{10} (a) Gravimetric	**1**
	vi.	The most significant gaseous air pollutant is: (d) SO_2	**1**
	vii.	Following is used for measuring intensity of sound. (a) Sound Level Meter	**1**
	viii.	What is the permissible noise level standard in the day time at residential zone? (b) 55 dB	**1**
	ix.	EIA is mandatory under which one of the following India legislations. (d) Environmental Protection act	**1**
	x.	In which year EIA was started in India (c) 1986-87	**1**

Q.2	i.	Explaining method of screening (As per explanation)	2 marks	**2**
	ii.	Working of rectangular sedimentation tank	2 marks	**3**
		Sketch.	1 mark	
	iii.	Design the grit chamber (Step wise marking)	5 marks	**5**
OR	iv.	Physical characteristics of sewage	1.5 marks	**5**
		Chemical characteristics of sewage	1.5 marks	
		Biological characteristics of sewage.	2 marks	

Q.3	i.	Defined biological treatment of sewage(As per explanation)	2 marks	**2**
	ii.	Sketch	2 marks	**8**
		Working	3 marks	
		Compare low & high rate trickling filter.	3 marks	
OR	iii.	Design the activated sludge unit treatment (Step wise marking)	8 marks	**8**

Q.4	i.	Definition	1.5 marks	**3**
		Explanation	1.5 marks	
	ii.	Particulate matter	3.5 mark	**7**
		Gaseous pollutant in ambient air.	3.5 marks	
OR	iii.	Working	3 marks	**7**
		Application of ESP	2 marks	
		Harmful effect of NOx	2 marks	

Q.5	i.	Effects of Noise Pollution on human health.	(1 mark*4)	**4**
	ii.	If a Sound source has a Pressure of 2000 micro pascal at 10 m distance with sound intensity 9.9×10^{-9} W/m^2 and the reference pressure (20 micro pascal), Compute:		**6**
		(a) The Sound Pressure Level in dB	3 marks	
		(b) The Sound Power in W.	3 marks	
OR	iii.	Explanation on "noise control"	4 marks	**6**
		Guideline	2 marks	

Q.6		Attempt any two:		
	i.	Explaining Stages (1 mark for each stage)	(1 mark*5)	**5**
	ii.	Impact of air	1.5 mark	**5**
		Impact of water	1.5 mark	
		Impact of noise	1 mark	
		Impact of socio-economic	1 mark	
	iii.	Report Writing		**5**
		Proposal, Screening, Scoping, mitigation, EIA Report [EIS], Review [Public and authority], Decision making, approval/ Not approval	5 marks	

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