Enrollment No......................................

Faculty of Engineering

End Sem (Odd) Examination Dec-2018
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. Chemical Oxygen Demand (COD) of sewage is the   **1**
(a) Oxygen required to oxidise biologically active organic matter
(b) Oxygen required to oxidise biologically inactive organic matter
(c) Both (a) and (b)
(d) None of these

ii. Primary treatment of sewage is meant for   **1**
(a) Removal of larger suspended matter
(b) Removal of fine suspended organic matter
(c) Removal of dissolved organic matter
(d) Removal of pathogenic bacteria

iii. Activated sludge treatment plants are normally preferred for   **1**
(a) Towns and smaller cities
(b) Medium sized cities
(c) Large sized cities
(d) All of these

iv. The secondary treatment of sewage is caused by   **1**
(a) Bacteria   (b) Algae   (c) Coagulants   (d) None of these

v. The device, which can be used to control gaseous as well as particulate   **1**
pollutants in the industrial emissions is known as:
(a) Cyclone   (b) Spray tower
(c) Dynamic precipitator   (d) Fabric filter

vi. The primary air pollutant, which is formed due to incomplete combustion   **1**
of organic matter is:
(a) Methane   (b) Sulphur dioxide
(c) Ozone   (d) Carbon monoxide

vii. Equivalent continuous equal energy level is also called as   **1**
(a) Equivalent noise level   (b) Sound intensity
(c) Sound levels   (d) None of these

viii. Noise level is measured in terms of   **1**
(a) Decimel   (b) Decibel   (c) Decibell   (d) Both (b) and (c)

ix. The practice of preparing an EIA for a project was first initiated by   **1**
(a) India   (b) China   (c) USA   (d) None of these

x. DPR stand for   **1**
(a) Delhi Public rate
(b) Detailed project report
(c) Detailed programme report
(d) None of these

Q.2   i.   What is decay or decomposition of sewage?   **2**

     ii.   Write a short note on BOD.   **3**

     iii.   Classify sewage treatment processes? Draw a flow diagram of a typical sewage treatment plant showing different units.   **5**

OR   iv.   Explain function and working details of skimming tanks with a neat sketch.   **5**

Q.3   i.   Write difference between primary and secondary sludge.   **2**

     ii.   Explain in detail construction and operation of trickling filters with a neat sketch.   **8**

OR   iii.   What is ASP? Write down its design process and parameters to be considered for designing.   **8**

Q.4   i.   Write down difference between primary and secondary pollutants.   **3**

     ii.   Explain in detail about the plume behaviour emitted from a stack with proper sketches.   **7**

OR   iii.   Determine the effective height of a stack with following given data: -   **7**
(a) Physical stack is 180m tall with 0.95 m inside dia.
(b) Wind velocity is 2.75 m/s
(c) Air temperature is 20^0C
(d) Barometric pressure is 1000 mill bars.
(e) Stack gas velocity is 11.12 m/s
(f) Stack gas temperature is 160^0C

Q.5   i.   Differentiate between continuous noise, intermittent noise and impulse noise.   **4**

     ii.   What is noise pollution? Discuss in brief various sources of noise and their typical noise levels in a modern society.   **6**

OR   iii.   Explain with a sketch how measurement of noise and its propagation is to be done?   **6**

Q.6   Attempt any two:
     i.   What is EIA? Explain the process of preparing EIA projects?   **5**
     ii.   Explain environmental inventory methods of impact identification.   **5**
     iii.   Explain environmental impacts of Sardar Sarovar dam project on the surroundings.   **5**

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Marking Scheme

CE3EL01 Environmental Engineering

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Q.1	i.	Chemical Oxygen Demand (COD) of sewage is the		**1**
		(c) Both (a) & (b)		
	ii.	Primary treatment of sewage is meant for		**1**
		(a) Removal of larger suspended matter		
	iii.	Activated sludge treatment plants are normally preferred for		**1**
		(c) Large sized cities		
	iv.	The secondary treatment of sewage is caused by		**1**
		(a) Bacteria		
	v.	The device, which can be used to control gaseous as well as particulate pollutants in the industrial emissions is known as:		**1**
		(b) Spray tower		
	vi.	The primary air pollutant, which is formed due to incomplete combustion of organic matter is:		**1**
		(d) Carbon monoxide		
	vii.	Equivalent continuous equal energy level is also called as		**1**
		(a) Equivalent noise level		
	viii.	Noise level is measured in terms of		**1**
		(b) Decibel		
	ix.	The practice of preparing an EIA for a project was first initiated by		**1**
		(c) USA		
	x.	DPR stand for		**1**
		(b) Detailed project report		

Q.2	i.	Explanation decay or decomposition of sewage		**2**
	ii.	BOD.		**3**
		Definition -1 mark		
		Explanation- 2 marks		
	iii.	Classification & short explanation of treatment processes		**5**
			2 marks	
		Flow diagram	3 marks	
OR	iv.	Skimming tanks with a neat sketch		**5**
		Functions	2 marks	
		Working	2 marks	
		Skimming tank sketch	1 mark	

Q.3	i.	Difference between primary & secondary sludge-		**2**
		Two differences each-0.5 marks each	(0.5 mark *4)	
	ii.	Explanation of about TF-definition, purpose	3 marks	**8**
		Explanation of Operation of TF	3 marks	
		Diagram of TF	2 marks	
OR	iii.	Explanation about ASP- Definition, purpose	2 marks	**8**
		ASP Design procedure & explanation	6 marks	

Q.4	i.	Difference between primary & secondary pollutants.		**3**
		3 differences for each- 0.5 mark for each	(0.5 mark *6)	
	ii.	Plume behaviour emitted from a stack with proper sketches.		**7**
		Explanation of 7 types of plume behaviour-		
		1 mark each with diagram	(1 mark * 7)	
OR	iii.	Determine the effective height of a stack with following given data:-		**7**
		Solution:-		
		Formula -	2 marks	

$$\Delta h = \frac{Vs.D}{u}\left[1.5 + 2.68 \times 10^{-3}P.D.\left(\frac{Ts-Ta}{Ts}\right)\right]$$

		= 8.92 calculation & answer	4 marks	
		H= h+Δh=180+8.92		
		=188.92 m	1 mark	

Q.5	i.	Differentiate between continuous noise, intermittent noise & impulse noise.		**4**
		Differences & explanation		
	ii.	Definition of noise pollution	1 mark	**6**
		Sources & their explanation	3 marks	
		Typical noise levels	2 marks	
OR	iii.	Measurement of noise and its propagation is to be done		**6**
		Explanation	4 marks	
		Sketches	2 marks	

Q.6		Attempt any two:		
	i.	EIA definition	1 mark	**5**
		Explanation & process	4 marks	

ii.   Environmental Inventory methods of Impact identification.   **5**

        Methods identification   1mark

        Explanation for Any two methods-

        2 marks each (2 marks * 2)   4 marks

iii.   Environmental impacts of Sardar Sarovar dam project   **5**

        Environmental Impacts   2 marks

        Salient features   3 marks

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