Register Number:……..

KUMARAGURU college of technology
character is life

B.TECH DEGREE EXAMINATIONS:APRIL 2018

(Regulation 2014)

Eighth Semester

BIOTECHNOLOGY

U14BTE304: Environmental Biotechnology

COURSE OUTCOMES

CO1: Identify the key concepts in ecosystems management

CO2: Summarize wastewater characteristics and treatment protocols

CO3: Construct systems for biotreatment of industrial effluents and solid wastes

CO4: Review the biodegradation pathways for xenobiotic compounds

CO5: Apply the concepts in developing environment-friendly bioproducts

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the following CO1 [K3]

List I	List II
A. Photoautotroph	i. Organic matter (Bacteria, fungi, plants)
B. Chemoautotroph	ii. Light (Bacteria)
C. Photoheterotroph	iii. Inorganic compounds (Bacteria)
D. Heterotroph	iv. Light (Bacteria, plants)

	A	B	C	D
a)	i	iii	iv	ii
b)	ii	iii	i	i
c)	ii	i	iv	iii
d)	iv	iii	ii	i

2. Assertion(A): Discharging the effluents from the oxidation ponds just up stream of lakes or reservoirs is undesirable CO2 [K2]

Reason(R): The discharged algae get settled in the reservoirs and cause anaerobic decomposition and other water qualities.

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true but R is NOT the correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

3. Assertion(A): The rate of degradation and microbes resistance to toxic pollutants remain better CO1 [K2]

Reason(R): when the mixed cell population is used

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true but R is NOT the correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

4. The rate of accumulation of sludge in septic tanks is recommended as CO2 [K2]

a) 30 litres/person/year b) 25 litres/person/year

c) 30 litres/person/month d) 25 litres/person/month.

5. What are the steps involved in carbon cycle in the ocean? CO3 [K2]

1. Diffusion between atmosphere and ocean
2. Dissolved carbon in ocean and sedimentation
3. Photosynthesis
4. Aerobic respiration

A) 1,3,4,2

B) 3,4,1,2

C) 4,2,3,1

D) 2,3,1,4

6. Contamination of water with sewage is indicated by cysts of CO3 [K1]

a) *Escherichia coli* b) *Balillus*

c) *Pseudomonas* d) *Leishmania*

7. Which are chemicals acting by non-covalent interactions? CO4 [K2]

i) Sarin, soman, and acetylcholine agonists.

ii) Benzo(a)pyrene and other genotoxic agents modifying DNA.

iii) Tetrodotoxin, saxitoxin and curare.

iv) Nitrate, reactive oxygen species and carbon monoxide.

a) i and ii b) ii alone

c) iii alone d) ii and iv

8. The only industrial biocatalyst in this list is: CO5 [K2]

a) Lipase b) Heme oxygenase

c) CytP450 d) Glycogen synthase

9. What is true about the biotransformation of xenobiotics? CO4 [K2]

a) Phase I modification can follow phase III conjugation. b) Phase I modification can follow phase II conjugation.

c) Phase I modification makes a compound water soluble d) Hydrophilic metabolites do not require phase I or phase II metabolism to be excreted.

10. The most important outcome of studying environmental biotechnology course is CO5 [K2]

a) Learn to use biotech to solve environmental problems b) Learn about environmental issues

c) Understand concepts of waste water pollution d) Understand concepts of air pollution

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Name any four inorganic and gaseous pollutants CO1 [K2]
12. Distinguish antagonism from parasitism CO1 [K4]
13. List the different types of methods to quantify organic matter in water. CO2 [K1]
14. Justify is anaerobic digestion is preferred for slugde removal CO2 [K2]
15. Infer Why Poly cyclic benzoates are carcinogenic. CO3 [K2]
16. Interpret the role of bio-surfactants in bioremediation. CO3 [K2]
17. Recall the sources of biofuels CO4 [K1]
18. Name the microbes involved in degradation of synthetic detergents CO4 [K1]
19. Interpret the importance on IPR on preserving biodiversity CO5 [K2]
20. Explain bioleaching with respect to rare metals CO5 [K2]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Explain the sources and types of water pollution. Describe the stages of waste water treatment	CO2	[K2]
22.	What is environment impact assessment (EIA)? Explain the process involved in EIA	CO1	[K2]
			[K2]
23.	Explain the methods to estimate COD and BOD	CO2	[K2]
24.	Explain the sources and types of solid waste. Discuss the solid waste management strategies in urban areas	CO3	[K2]
25.	Explain the use of GMOs in bioremediation	CO4	[K3]
26.	Summarize the process types and applications of bioremediation.	CO4	[K4]
27.	Outline the importance of IPR in protecting the natural biodiversity. Support your claims with suitable examples.	CO5	[K3]

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