Roll No:

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
ENVIRONMENTAL BIOTECHNOLOGY

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	What are the major sources of air pollution?	1	1
b.	Define thermal pollution and provide an example.	1	2
c.	What is the role of methanogenic microbes in anaerobic digestion for wastewater treatment?	2	1
d.	Describe the difference between anaerobic and aerobic processes in wastewater treatment.	2	1
e.	What is the principle behind the Activated Sludge Process in wastewater treatment?	3	1
f.	Define the function of a trickling filter in waste treatment systems.	3	2
g.	What is bioconversion, and how is it applied in waste-to-wealth processes?	4	2
h.	Explain the concept of biomineralization in the context of environmental remediation.	4	2
i.	What is the role of carrying capacity in sustainable development?	5	2
j.	Define "baseline studies" in the context of Environmental Impact Assessment (EIA).	5	2

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

Q no.	Question	CO	Level
a.	What are the genetic consequences of exposure to radiation, and how can radioactive contamination affect human populations?	1	6
b.	Design a waste treatment process that integrates anaerobic digestion for methane production and its use as biofuel. Discuss how you would ensure the treatment is environmentally sustainable and economically viable.	2	6
c.	Discuss the operational mechanism and advantages of the Fluidized Expanded Bed Reactor (FEBR) in waste treatment. Include the factors affecting its performance.	3	4
d.	How does the bioconversion of cellulose-rich waste into biofuels contribute to a circular economy? Discuss its environmental and economic implications.	4	6
e.	Discuss the objectives and scope of the Environmental Protection Act, 1986, in relation to environmental management.	5	4

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Discuss the effects of marine pollution on aquatic ecosystems and the methods used to measure it.	1	5
b.	Describe the process of radioactive decay and its implications for radioactive waste disposal.	1	4

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4. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	How does the anaerobic digestion process contribute to the sustainability of waste management systems and the production of biofuels?	2	2
b.	Evaluate the effectiveness of biological waste treatment methods, such as activated sludge and bioreactors, in comparison to conventional chemical treatments for wastewater.	2	5

5. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Explain the design considerations and kinetics of the Upflow Anaerobic Sludge Blanket (UASB) reactor. How does it compare to other anaerobic treatment methods?	3	3
b.	Analyze the kinetics of the Contact Process used in bioreactors. How do environmental factors such as temperature and pH affect its performance?	3	3

6. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	What are the challenges in converting agricultural waste into value-added products like hydrogen (H2) and food/feed stocks?	4	4
b.	Describe the process of bioleaching and its importance in metal recovery from ores. Include an explanation of the microbial mechanisms involved.	4	5

7. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Analyze the significance of the Water (Prevention and Control of Pollution) Act, 1974, and its impact on industrial practices.	5	4
b.	Describe the process of Screening and Scoping in Environmental Impact Assessment (EIA). Why are they important? https://www.aktuonline.com	5	4