22ESP211N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2024
(Second Semester)

Branch- ENVIRONMENTAL SCIENCE

ENVIRONMENTAL BIOTECHNOLOGY AND NANO TECHNOLOGY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Question No.	Question	K Level	CO
1	The term 'carbon footprint' refers to___. a) Amount of NO_2 released to the atmosphere b) Amount of CO_2 utilized by plants c) Amount of CO_2 sequestered d) Amount of CO_2 released to the atmosphere	K1	CO1
2	Biomanipulation is process of introducing ___ to the water bodies to predate on algal blooms. a) Phytoplanktons b) Zooplanktons c) Fishes d) Chemical agents	K2	CO1
3	Thiobacillus ferroxidant is associated with a) Biodecolourisation b) Biofiltration c) Biosurfactants d) Bioleaching	K1	CO2
4	Bioremediation with the application of green plants are known as a) Biofiltration b) Bioaugmentation c) Phytoremediation d) None of these	K2	CO2
5	Heterocycts are related to a) Nitrate assimilation b) Nitrogen fixation c) Bioremediation d) Bioleaching	K1	CO3
6	Biosafety level 3 is for ___ a) Pathogens that are not fatal b) Pathogens that are fatal but treatment exist c) Pathogens that are fatal and no treatment exist d) None of these	K2	CO3
7	Fullerenes are allotropes of a) Carbon b) Aluminium c) Silicon d) Zeolites	K1	CO4
8	Turkevich method is commonly used for the synthesis of ____ using ___ a) Silver nanoparticles using zeolites b) Gold nanoparticles using Citrate c) Nanopolymers using organisilicates d) None of these	K2	CO4
9	Carbon nanotubes are considered as good adsorbents due to a) High Surface area b) High aspect ratio c) Better material properties d) All of these	K1	CO5
10	Who is considered as Father of Nanotechnology? a) Philip Johnson b) Buckminster Fuller c) Heinrich Rohrer d) Frank Lloyd	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	Outline the regulations on application of GMOs on environmental issues.	K2	CO1
	(OR)		
11.b.	Explain the methods adopted in cell immobilization and bioremediation.		
12.a.	What are the environmental impacts of bioleaching? Demonstrate a potential adverse effect.	K2	CO2
	(OR)		
12.b.	Define heavy metals as pollutants with Cd as example.		
13.a.	Illustrate on the guidelines followed by India in biosafety in pathogenesis.	K3	CO3
	(OR)		
13.b.	What are the advantages of application of organic fertilizers and cellulolytic microbes?		
14.a.	Demonstrate the chemical methods of nanoparticle synthesis.	K3	CO4
	(OR)		
14.b.	Explain about the characterization of any nanomaterial for the synthesis of nanoparticle.		
15.a.	Elaborate on nano-based water treatment.	K5	CO5
	(OR)		
15.b.	Explain about the organic pollutants present in soil.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Question No.	Question	K Level	CO
16	What causes algal blooms? Outline the ecosystem damage due to severe algal blooms.	K2	CO1
17	Demonstrate about the oil pollution and bioremediation in aquatic environment.	K3	CO2
18	Classify various nitrogen fixers and explain the mechanism of nitrogen fixation.	K2	CO3
19	Elaborate on the possible hazards and management in the implementation of nano materials as remedial measures in the environment.	K4	CO4
20	Write an essay on 'practical difficulties in the application of nano-engineering and pollution prevention'.	K5	CO5

Z-Z-Z END